Saguaro Astronomy Club

Sacnews

Volume 26 Issue 1 January 2002

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Inside this Issue

Angel and Twinkling Stars

By Marjory Williams and Jack Jones

Other planets are being found that circle their own suns.

Roger Angel spoke on new methods of finding and directly observing extra-solar planets on December 3, 2001 in the main lecture hall at the new Learning Center recently completed on (or in) the Quad of the University of Arizona in Tucson. The facility is built completely underground. The talk was a pleasant 60 minutes and worth the Monday work-night drive to the University.

Dressed in a sweater and Levis, Roger Angel quietly explained the technology that is present now and that is needed in the future to detect extra-solar planets directly. Currently one can use sodium fields to detect a Brown Dwarf - which isn't so dwarfish – they are 50 times the mass of Jupiter.

Roger Angel explained that if one takes the twinkle out of stars, using adaptive optics, one is more likely to find a planet, and with the use of interferometry, to cancel the star's light and allow direct and high-resolution observation of that planet. He intends to use the Mt. Graham Large Binocular Telescope and its adaptive optics to do so. That telescope is the one with the two eight-meter mirrors, each one larger than a two-car garage. But he regards the LBT as just a starter scope. He has plans to make fourteen more mirrors just like these, and cluster them in two groups of seven – six mirrors in a circle with a seventh in the middle of each cluster. He calls it the 20/20 telescope, each side weighing in at 850 tons. The adaptive optics will be in the cryostatic secondary. The two 21-meter clusters will be deployed on a 100-meter diameter ground track and will give the equivalence of a 120-meter telescope when operated as a Fizeau imaging interferometer. (With Nasmyth foci, the telescopes can be operated independently!)

Roger also discussed placing several independent telescopes in space with a 50-meter spread for the greatest aperture ever created and complete elimination of any atmospheric turbulence and background heat. An additional enemy would be the thermal radiation from our Zodiacal light. To defeat this, a telescope could be placed outside of Jupiter's orbit. This telescope could be a lot smaller, and using Bracewell interferometry, detection of extra-solar planets down to Earth-size would be possible.

After the talk we met him and picked up an autograph. Roger Angel has consented to speak to our Club this year. We were invited over to the Steward Observatory for an after-hours look around the sky by a couple of their graduate student telescope operators. It is in a large old building quite hidden now among all the other buildings constructed around it over the years, but right across the street from Flandrau Planetarium. The dome is accessible by spiraling up four flights of red-lighted wooden stairs. At the top is a 21-inch yoke-mounted Cassegrain. We enjoyed looking through the telescope at gamma Andromedae and M31 and several other objects. For experienced eyes, it was not as good as an 8-inch at Sentinel because of the not-too-good seeing giving somewhat lousy contrast. But the real fun was riding around up in the rigging to put the Cassegrain to bed.

2002: A Year of Sky Events

A Listing of Joe Orman Moments

Compiled by Joe Orman

Mark your calendar for these interesting planetary alignments, conjunctions, occultations & meteor showers in the year 2002. Times are calculated for Phoenix; other locations may differ. Most will be easy to see with the unaided eye, some very challenging -- take a look!

- January 14 (evening): Mercury 4 degrees to upper right of crescent moon, low in WSW after sunset.

- February 20 (afternoon-evening): Moon occults Saturn in daylight, high in sky (disappears 4:17pm, reappears 5:14pm MST). Saturn 1 degree from moon after sunset.

- February 22 (evening): Jupiter 1/2 degree from gibbous moon, very high in sky after sunset.

- March 17 (evening): Mars 4 degrees to upper right of crescent moon, high in W after sunset.

- March 20: Spring equinox (12:16 pm MST). Sunrise straight east (6:32am, azimuth 89.6 degrees), sunset straight west (6:40pm, azimuth 270.7 degrees). Always use proper eye protection when viewing the sun.

- March 21 (evening): 1st-quarter moon occults star cluster M35, high in sky (disappears approximately 9:30pm, reappears approximately 10:15pm MST).

- April 14-16 (evenings): Alignment of Jupiter, Saturn, Mars and Venus, in W after sunset. Moon 4 degrees to upper left of Venus April 14, 2 1/2 degrees to left of Mars April 15, 3 degrees above Saturn April 16.

- April 16 (daytime): Crescent moon only 4 arcminutes away from Saturn (11:33am MST), high in E. Grazing occultation for extreme NW Arizona, full occultation NW of Arizona.

- April 20 – May 15 (evenings): All 5 (!!!) naked-eye planets (Jupiter, Saturn, Mars, Venus, and Mercury) in line, in W after sunset. Saturn, Mars and Venus make 3-degree triangle on May 5. Mars and Venus 1/3 degree apart on May 10. Moon 2 degrees from Mercury on May 13, 1 degree from Venus on May 14, between Jupiter and Venus on May 15.

- June 3 (evening): Jupiter and Venus 1 1/2 degrees apart, with Mars below, in W after sunset.

- June 10 (afternoon): Partial solar eclipse, 5:19pm to 7:19pm MST, in W. 60% eclipsed at maximum.

- June 12 (evening): Crescent moon 2 1/2 degrees to right of Jupiter, with Venus above and Mars below, in W after sunset.

- June 13 (evening): Crescent moon 2 degrees above Venus, Jupiter and Mars below, in W after sunset.

- June 20 (evening): Venus 1/3 degrees above Praesepe ("Beehive" star cluster), in W after sunset.

- July 2 (morning): Saturn and Mercury 1/4 degree apart, low in ENE before sunrise.

- July 2 (evening): Jupiter and Mars 3/4 degree apart, extremely low in WNW after sunset (too close to sun to see?).

- July 8 (morning): Saturn 1 degree to right of crescent moon, low in ENE before sunrise.

- July 10 (evening): Venus 1 degree above 1st-magnitude star Regulus, in W after sunset.

- August 9 (evening): Mercury 4 degrees to lower left of crescent moon, very low in W after sunset.

- August 11 (evening): Crescent moon 5 degrees to upper right of Venus, in W after sunset.

- August 12 (night): Perseids meteor shower. Moon, just past new, will not interfere. Shower radiates from constellation Perseus, which rises in NE about 10pm MST. May produce 50 to 100 meteors per hour. Best time to look between midnight and dawn.

- August 31 (evening): 1st-magnitude star Spica 1 degree to upper right of Venus, low in WSW after sunset.

- September 4 (morning): Crescent moon 3 degrees to left of Jupiter, with Praesepe ("Beehive" star cluster) between, in E before sunrise.

(Continued on page 8)

Astronomy 101
Pushing Glass
By Rick Tejera

When I first started in astronomy, the idea of grinding my own optics seemed like monumentally laborious process best left to others. The idea of rubbing two pieces of glass together until one of them had a very precise curve to it also seemed beyond reasonable ability. I thought you needed skills beyond those of ordinary mortal men. Now I have in my possession, 2 five-inch mirror blanks and a 12 ½" blank. I fully have the intent to turn these into telescopes. Although I still have to learn and practice, I've since been inspired and now think that this is something I can do.

The November ATM subgroup meeting was held at Paul Lind's house. He graciously gave Jennifer Keller, Rick Rotramel, Jack Jones, Thad Robosson and myself a demonstration of the techniques needed to turn an ordinary piece of glass into an instrument capable of opening the sky to us. During our time there Paul explained the concepts and showed us the tools he uses to make, in this case, a corrector lens. We got to see how to use the tool to grind the curve into the glass, both the old fashioned manual way, and using the machine Paul made to automate the process. He showed us how to make a pitch lap and how it is used to polish the glass to its final shape. Finally we were shown his Foucault tester and how it can be used to verify the focal length of the mirror and how it will show if the mirror is figured properly.

I left that evening with a sense of confidence that pushing glass is not beyond my limited craftsmanship. Although it obviously takes practice and patience, mirror making is far from being a lost art form. It requires very little in actual materials outside of the glass itself and the grit and pitch, so cost isn't an issue. The most important thing to me will be the day when Bhuela see first light, and I say I made the optics.

SAC members participating in the ATM Subgroups Telescope making demonstration. From left to right:
Our gracious host, Paul Lind, Jennifer Keller, Rick Tejera, Jack Jones, Thad Robosson, and Rick Rotramel.

We are posing behind Paul's grinder. The Glass blank spins on a spindle on bottom while the tool is guided by the cross bar above.

Our thanks to Paul for his hospitality and inspiration.

For more images of this meeting go to page 8

Fuzzy Spot, Auriga

By Ken Reeves

Last year I seemed to focus on many small constellations with few bright or spectacular objects. This year I am sticking with constellations that have much brighter objects (although there will be a few challenging ones included). To start with, lets look at Auriga.

Auriga, the Charioteer, has a confusing background. The ancient Greek and Roman descriptions call it the Charioteer, but have no mention of his chariot. With the Babylonians, it is the opposite; the star pattern is referred to as the chariot.

Since this constellation sits on the winter Milky Way, it is full of open clusters. In particular, the three Messier Objects, M-36, M-37, and M-38, are fantastic in any optics, including binoculars. Take a look for yourself. All these observations were taken in my 10" scope.

NGC 1664 (04 51.1 +43 42): This open cluster sits in the far western part of the constellation. It was seen as pretty large, somewhat bright, somewhat poor, and pretty loose. I saw a few strings of stars, and a single bright star on the ESE side of the object, and most of the other stars in groups of 3 or 4. Not counting the bright star, I saw two levels of stars with some possible background haze, and counted about 40 stars. This cluster is so loose; it was hard to tell where the edge of the cluster is.

NGC 1857 (05 20.2 +39 21): This open cluster is somewhat small, pretty faint except for a couple of stars, somewhat rich and somewhat condensed. There is a bright central yellow star, which is a close double. There are four levels of stars with some possible haziness, and a count of 38 stars with more seen when using averted vision. There is a nice triangle of stars to the N of the cluster. This cluster and the stars to the N form open cluster Cz 20.

NGC 1893/IC 410 (05 22.7 +33 24): This is an open cluster (NGC 1893) and nebula (IC 410) combined. The cluster is somewhat small, somewhat bright, very poor and loose. There are 35 stars seen, and a little bit of haze. Using the UHC filter brings out the nebula. Most of the nebula is around the cluster. To the W of the cluster, the nebulosity darkens up quickly; on the N and NE it fades away more slowly. The most prominent area of nebulosity is NW of the cluster.

NGC 1907 (05 28.0 +35 19): This open cluster sits on the fringe of M-38 and forms a nice contrasting pair with it. It is somewhat bright, somewhat small, somewhat rich, and very condensed. There are 3 levels of stars over some haze with 30 stars counted. Two bright stars are to the S, which are probably not part of the cluster. Using low power pairs it up nicely with M-38.

NGC 1912 (05 28.7 +35 50): M-38 is a somewhat large cluster, pretty bright, rich, and somewhat condensed. There is a single star in the middle with a void surrounding it, then a good concentration of stars, and finally a looser scattering of stars at the outside. It is almost like a cluster within a cluster. There are 4 or 5 levels of stars with 85 stars counted in the concentrated part, and a total of about 175 stars when you include the loose concentration. The stars roughly form a "K" with the central star at the center of the K.

NGC 1931 (05 31.4 +34 15): This is a pretty small and somewhat bright nebula surrounding a triple star. The nebula does not extend very far from the three stars. Using averted vision helps a little, but the nebula does not respond to the UHC filter.

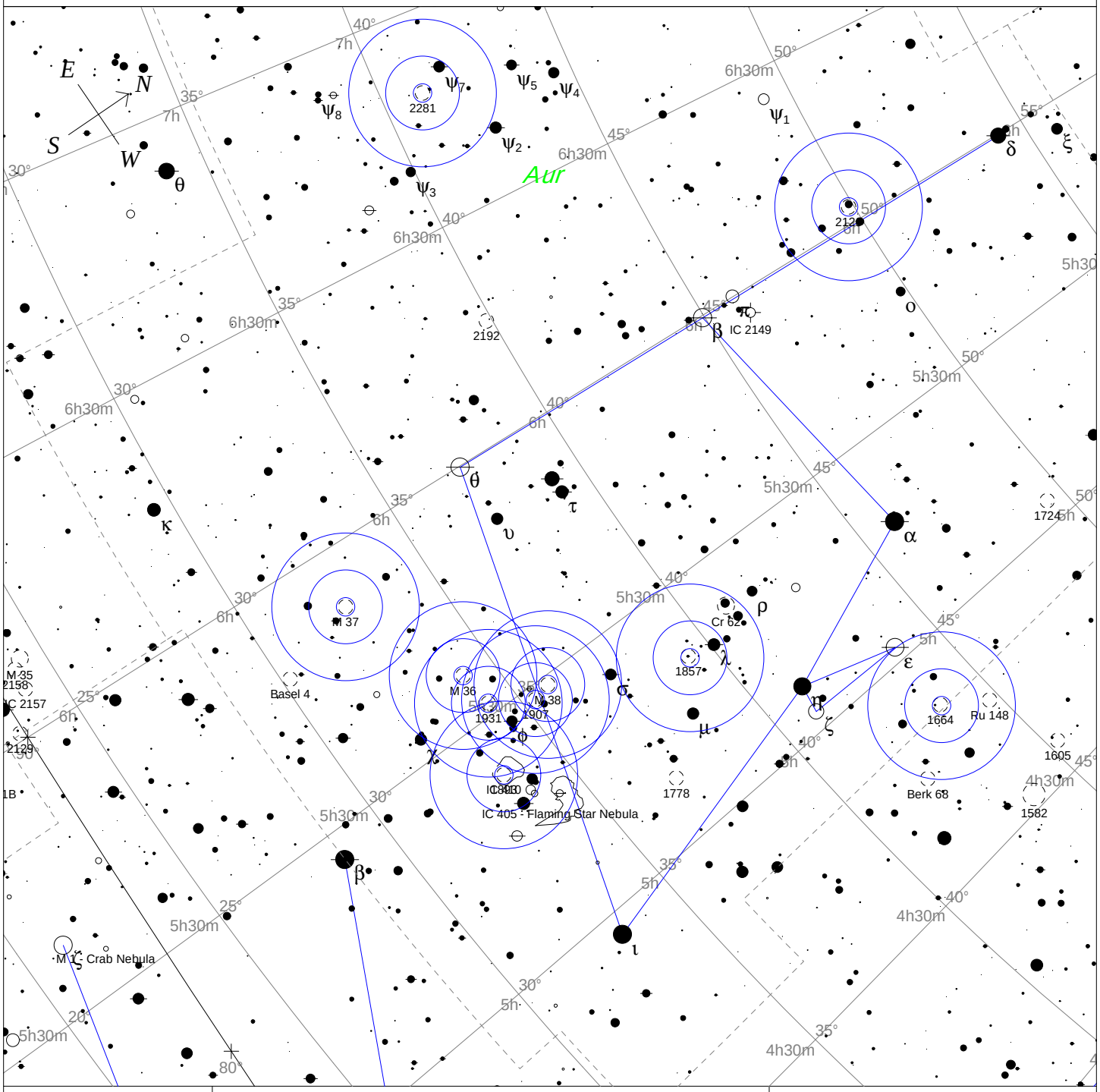
NGC 1960 (05 36.1 +34 08): This is the second Messier cluster, M-36. It is very large, very bright, pretty rich, and loose. There are 3 levels of stars with a real nice double in the middle, a total of about 55 stars. Some of the stars show some red and blue color. This is a nice bright cluster with some interesting star strings.

NGC 2099 (05 52.4 +32 33): M-37 is the last of the Messier objects in Auriga. It is the best in Auriga and one of the best in the sky. It is very large, pretty bright, very condensed, and very rich. A bright yellow star is in the center. There are 3 levels of stars with a total star count of about 120, maybe 200 with averted vision. It forms a triangle pointing E with dark areas making a negative outline of an "A". This is a real nice cluster whether looking at it from town, at a fair site, or from a real dark site.

NGC 2126 (06 03.0 +49 54): This cluster is SW of a bright star, somewhat large, slightly faint, pretty poor, and very loose. There are 3 levels of stars not including the bright star plus a handful of threshold stars, with a total of about 25 stars. To the N and NW of the bright star are 3 more stars.

NGC 2281 (06 49.3 +41 04): The last open cluster of the month is very bright, somewhat large, somewhat poor, but what is there is fairly condensed. The central section contains 4 real bright stars, with 2 containing faint companions. There are several strings radiating from the start, and 3 bright stars bordering the cluster. There are 3 levels of stars, with a count of 37, 28 of them are in the central concentration. This is a nice cluster, out away from the Milky Way so the background stars don't swamp the cluster out.

Fuzzy Spot
Auriga



STARS		SYMBOLS			
<3	>8	Multiple star	Dark nebula	Radio source
4		Variable star	Globular cluster	X-ray source
5		Comet	Open cluster	Other object
6		Galaxy	Planetary nebula	
7		Bright nebula	Quasar	

Herschel 400 Objects: 1664, 1857, 1907, 1931, 2126, 2281
SAC's 110 Best of the NGC Objects: 1907, 1931

Local Time: 00:00:00 9-Dec-2001 UTC: 07:00:00 9-Dec-2001 Sidereal Time: 04:41:04
Location: 33° 39' 56" N 112° 49' 10" WRA: 5h44m01s Dec: +38° 04' Field: 29.2° Julian Day: 2452252.7917

Uranometria 2000.0 Second Edition

A book review

By Thad Robosson

Ok, I'm a book nut. Not your typical book nut though, I'm a nut for things like technical books, atlases, how-to, etc. If I'm interested in the topic, chances are I've got a decent collection of tech books for that topic. Astronomy is no different. My astronomy books could fill a 10-foot shelf, and a goodly part of these books are atlases. Most astronomers could be happy as a clam with one good atlas…not me. I'll use different atlases for different reasons. Casual night? Sky Atlas. Double stars? Millennium Sky Atlas. M's or NGC's? Uranometria. Sometimes, I combine the courser Sky Atlas with the MSA or Uranometria. Needless to say, I was happy when Santa-wife gifted me with the Second edition of Uranometria 2000.0. And now that I've looked through it a bit, here are some of my impressions of this new set.

The authors of the new edition of U2000 had input from a veritable who's who in astronomy… Brian Skiff, Brent Archinal, Sue French, Richard Berry, George Kepple, Harold Suiter, Glen Sanner, and others. All this input has resulted in quite a few changes. The most notable is the rethinking of the chart numbering and layout. In the new U2000, both the right and left pages make up one chart number, and as the chart number increase, the RA decreases. This results in a larger, 2-page chart, and a flowing layout that is considerably less confusing. An additional set of chart keys is useful too. Volume 1 and 2 both come with 4 chart keys reminiscent of the old version, down to mag. 5.5, but also have a much finer scale set of 22 chart keys that go down to mag. 6.5. (This finer set contains the Messier objects, but not the NGC; while much more usable for this atlas, it is not as usable as Sky Atlas.) The actual charts have been upgraded too. The 220 "regular" charts now go down to mag. 9.7, and, most notably, include one heck of a lot of new galaxies (It's not just NGC anymore!). The authors have also added some extra charts of a much finer scale for areas of interest. Spread between both volumes, there are 26 fine scale charts of areas such as the North American / Pelican Nebula, the Gamma Cygni Region, the Pleiades, the Scutum Star Cloud, the Virgo/ Coma cluster, the Perseus Cluster, several of Abell clusters, Trifid/Lagoon Nebula, M6/M7 region, Zeta Scorpii Region, and the Large and Small Magellanic Clouds. These finer scale charts typically go down to 11.5 mag, and may include even fainter stars. All charts have object keys at the bottom. These symbols are fairly universal now, and you won't find any real surprises. This did however; give me my one disappointment, in that double stars are still treated in the same manner as the first edition. There is no way of knowing the PA and Sep. of any doubles in U2000 without consulting another source. In the back of each volume is an index that gives chart numbers for Bayer designations, Messier, NGC, and common names.

The acetate overlays that come in volume 2 with the familiar "grids" to help in pinpointing a coordinate, also have a series of circles from a quarter degree to 3 degrees. Also included is the welcome addition of a Telrad circle. While I did receive volume 3, the Deep Sky Field Guide, my first edition copy is currently packed with my other books. As such, I am at loss to discuss the improvements bestowed upon the second edition.

Will this new version be of any more use to you if you already own the first edition? Most likely. The finer scale charts have much detail, and you could spend hours at the 'scope just on one chart. The "fine scale" chart keys make it that much more usable. The fainter magnitude limit helps considerably. And all the new galaxies will make the faint and fuzzy hunters quite happy. I cannot say that the first edition is obsolete just yet, but there are many notable improvements that make this a good investment if your first edition copy is worn and tattered.

January 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 January 2002

Jan. 1st	Jupiter at opposition at 0552 mst
Jan. 1st	Ceres discovered by Piazzi in 1801
Jan. 2nd	Earth at Perihelion
Jan. 3rd	Quadrantid Meteor Shower peaks
Jan. 5th	SAC Star Party at Flat Iron Mountain Site. Sunset 1737, Ast. Twilight ends 1906, Moonrise 0049
Jan. 6th	Moon at 3rd Quarter 0355mst
Jan. 13th	Moon is new at 1329
Jan. 21st	Moon at 1st quarter at 1747
Jan. 24th	Hagomoro, the first Japanese lunar probe launched in 1990.
Jan. 25th	SAC General Meeting, 1930 at Grand Canyon University, Speaker Maggie Turnbull will discuss the SETI Program
Jan. 28th	Moon is full at 2250

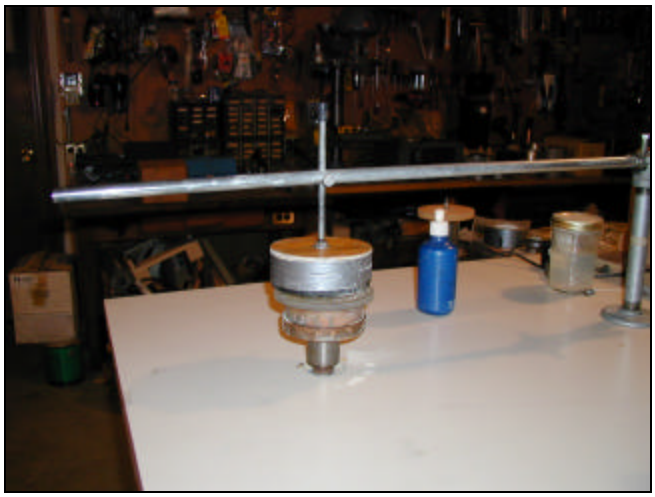
Future Planning

March 8th-9th	Sentinel-Schwaar Star Gaze
April 13th	All Arizona Messier Marathon

Images from the November 27th ATM Group Meeting

Taken By Paul Lind

The Pitch Lap used to polish the lens. The lens is on the left, the brown coloring is the Cerium Oxide Compound used to polish the glass.



Another view of Paul's glass grinder. The tool (wrapped in duct tape is moved across the surface of the lens with the crossbar, giving an even curve.

(Ed note: If you are interested in Amateur telescope making, consider participating in the ATM subgroup. The group meets the Tuesday before the general meetings at Thad Robosson's shop. For more information contact Thad at 602-826-0328 or starstarcracker@qwest.net)

(Continued from page 2)

- September 22: Fall equinox (9:56pm MST). Sunrise straight east (6:16am, azimuth 89.1 degrees), sunset straight west (6:26pm, azimuth 270.6 degrees). Always use proper eye protection when viewing the sun.
- October 5 (morning): Mars-moon-Mercury triangle 5 degrees apart, low in E before sunrise.
- October 10 (morning): Mars 3 degrees above Mercury, low in E before sunrise.
- November 8 (evening): Moon occults 2nd-magnitude star Sigma Sagittarii, in SW after sunset (disappears in twilight 6:18pm, reappears at night 6:58pm MST).
- December 1 (morning): Moon-Mars-Venus triangle within 3 degrees, in ESE before sunrise.
- December 7 (morning): Mars 1 3/4 degrees to right of Venus, in ESE before sunrise.
- December 13 (night): Geminids meteor shower. Gibbous moon will interfere until it sets about 1am. Shower radiates from Castor in constellation Gemini, which rises in NE around 7pm and is near zenith in early morning hours. Best time to look between moonset and dawn. May produce 60 meteors per hour.
- December 19 (morning): Saturn 3 degrees to left of setting full moon, low in WNW at dawn.
- December 30 (morning): Moon-Venus-Mars triangle 5 degrees apart, in SE before sunrise.

I would like to thank Sam Herchak for his kind assistance in compiling this list.

Photo Pages: http://pages.prodigy.net/pam.orman/JoeHome.html

Bits & Pieces

Minutes of the October General Meeting

Our esteemed president Jack Jones opened the meeting at 7:30pm MST and made the standard announcement for visitors and new members to identify themselves. One of the visitors indicated he had some property west of the White Tank Mountains and was willing to make it available for a SAC Star Party or two.

Next announcement was the Public Star Party at REACH 11's Horse Lovers Lane scheduled for the following evening.

AJ Crayon announced some telescope items for sale and an eclipse trip; both received via e-mail. The Deep Sky meeting was announced as being on November 1st, same time same place. Also remember that the December regular meeting will be held on Saturday the 29th at my house – potluck is the watchword.

The President opened nominations for next year with two incumbents willing to tough it out for another year; they are Vice President Diane Hope and Secretary AJ Crayon. That leaves the offices of President, Treasurer and Properties up for grabs! There were no nominees beyond the incumbents. Remember the three offices up for grabs MUST be different members as they have served the two-year limit - and served it well!! Nominations are open until the next meeting, during which we will select our 2002 officers. If you have some in mind that might consider running, first speak to them to see if they are willing to serve and, if so, nominate them at the next meeting.

The ATM group will meet December 27th at Paul Lind's where he will show how a small, 4 1/2", mirror/lens is ground. If you are interested in attending, please see Paul or the ATM leader, Thad Robosson for details.

Adam Sunshine reminded everyone about the November Public Star Party at Garden Lakes Elementary School. He announced his resignation as our Public Star Party leader. This is not an elective office and anyone wanting to meet the public and discuss astronomy, this is your chance. Note, there is no two-year limit on this office. Anyone interested should see the President or Adam Sunshine for more.

Peggy Kain gave treasurers report; we have $2481.11 in checking and $2037.57 in savings. The club is also insured for meetings and all star parties.

If you are interested in a 2002 Astronomy Calendar, for $10.00, see Peggy.

At the beginning of Show and Tell there were approximately 40 people in the meeting room.

Peggy Kain started this part of the meeting by passing out some forms used by her high school students. One was a sheet of graph paper and the other had Galilean Moon Data and the assignment was to plot the data on the map to see what the orbits looked like. No, neither "Astronomy" nor "Sky and Telescope" magazines would help, as the dates were far enough part!

Next Steve Dodder showed a series slides of Saturn being occulted by the moon. He captured all four contacts.

Finally Chris Schur shared a couple of months worth of CCD images - they were very good months!! Of particular note was M57 with its color striations along with 15th magnitude field galaxy IC1296. It was so obvious and so bright it didn't look real. We also saw new images of M101 and M33. His presentation was ended with a picture of Copernicus - yes the lunar crater. After the break Vice President Diane Hope introduced ASU Astronomer Paul Scowen. He discussed recent advances in molecular clouds and used many beautiful pictures from the Hubble Space Telescope Heritage Project.

AJ Crayon
SAC Secretary

Such A Deal

For Sale: Coulter 14-1/4" F/7 mirror, Novak 9pt mirror cell, 2.25" ma diagonal and cylindrical spider. $600 Contact Paul Maxson at sunspot51@home.com or 623-975-9232.

A Night at the Vega-Bray Observatory

by Joan McGue

In planning a trip to the Kartchner Caverns, I neglected to note in making reservations that the weekend was a star party weekend. Not wanting to miss a month of observing, I looked into options around the Benson Area. I had heard about the Skywatch Inn, but did not know much about. Upon inquiry, I found out that their rooms were booked up that weekend. However they let non-guests use their telescopes for a fee or even let you bring your own and observe for free, as long as you let them know in advance. I opted to be lazy and rather than bring my own 8 inch Dobsonian, I decided to rent their 12 inch Dobsonian for $35 per night,

The Inn also has other telescopes for rent including a computerized 20" f/10 Maksutov Cassegrain for $95 per night. I got to have a look through the Maksutov and had a spectacular view of M65 and M66. For the more complicated telescopes other than the Dobs, however, the there is an $85 charge for a Starguide, which are amateur astronomers or professors that they hire from the Tucson area. Too bad some of our members couldn't get a gig like this.

The Inn was located about four miles from our hotel and two miles off interstate 10. The drive to the inn was only about ten minutes. It is situated on a dirt road and is up on a hill side, so there are no obstructions on the horizon. Upon arrival, they showed me the Inn and helped me set up the Dobsonian with a variety of eyepieces. (And even offered cookies and coffee). The premises were nicely furnished and looked comfortable. I had the option of setting up on the patio or in a 20 x 27 foot roll-off roof room with a variety of scopes (6" to 14.5"). There is also a 14 foot electronically controlled dome room with the 20" Maksutov. I chose the patio, because the observatory room seemed too claustrophobic and because I am used to observing in an open area. The main advantage to the observing rooms is that the walls block out any extraneous light and all you see is the sky overhead. This would probably be a definite advantage for astrophotography. (You also have the advantage of getting to a bathroom without going through a lighted room).

I found the sky condition excellent for the most part. Although there was some light pollution to the west from Benson and Tucson, it was not the overwhelming glare that one gets from Phoenix. and it only covered a low amount on the horizon. There was a limited glare from Sierra Vista and Wilcox, but the southern and eastern horizon were black for the most part. I managed to find NGC 3432 and NGC 3115. I also looked at M13, M51 M65, M66 and NGC 5139 and 5195. There are ponds on the premises, so I heard the ducks squawking while I was waiting for the sky to get dark.

The owner, Mr Vega, was very friendly and enjoyed sharing his interest in astronomy He let me look at M13 and M65 and M66 through his 20 inch scope. I could actually see that M65 and M66 were ellipticals and that one of them had an irregular center. Having only an 8 inch Dob, I usually do not see much detail in galaxies, so this was a treat. The owner is apparently a pathologist in Tucson.

I had dragged my husband and my eight year old girl along with the thought they might like looking at objects in the telescope. They looked for about 20 minutes, then went inside. The Inn has a children's room with books and scientific toys and a VCR. I was worried about them getting bored, but they managed to amuse themselves.

I did not stay out too late because we had to go to the Caverns in the morning. I would love to stay at the Inn sometime. They recommend reserving a room three months in advance. Sierra Vista is a renown area for birdwatching. Imagine, birdwatching doing the day and star gazing at night! And being comfortable doing it, no less.

The Inn has its own web site at:
www.communiverse.com/skywatcher.

Lunar Occultations from Phoenix

By Brian K. Vorndam

UNIVERSAL TIME AND DATE OF TOTAL LUNAR OCCULTATIONS FROM PHOENIX(+33.5,112.0W)
CORRECTED FROM STANDARD STATION NM(1) AND LA(2) FOR 2002.

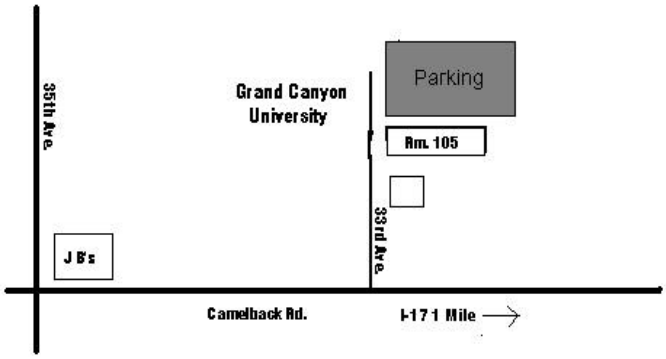
DATE	TIME (1)	TIME (2)	MAG	STAR INFORMATION	PH	PA1	PA2	PS	ELG	MA	MAZ	SAL	SAZ
1/ 1	11:42:27	11:43: 6	4.7	ZC1308 (γ CNC)	RD	312	298	81	215	59	256	-34	97
1/19	1:16:11	TWILIGHT	4.7	ZC0005 (33 PSC)	DD	118		35	63	45	215	-7	250
1/21	MOON ALT	7:12:56	4.7	ZC0249 (ν PSC)	DD		064	48	87	3	275	-75	336
1/25	7:55:14	7:56:28	4.7	ZC0752 (ι TAU)	DD	101	108	75	135	40	272	-75	16
1/26	9:13:24	MISS	4.3	ZC0916 (1 GEM)	DD	181		83	150	37	276	-64	61*1
2/20	23:17:42	23:22: 6	0.1	(SATURN)	DD	026	001	54	98	54	102	21	240
2/20	0:17:11	23:57:12	0.1	(SATURN)	RB	283	307	55	98	63	113	12	248
2/25	8:14:53	8:15: 1	4.7	ZC1308 (γ CNC)	DD	073	089	87	156	56	259	-64	20
2/28	10:14:24	10:15:14	4.2	ZC1702 (ν VIR)	RD	329	313	91	197	56	223	-46	64
3/ 7	MOON ALT	17:38:42	2.9	ZC2672 (λ SGR)	DB		163	39	291	20	219	42	139
3/ 7	MOON ALT	17:55:23	2.9	ZC2672 (λ SGR)	RD		186	38	291	18	222	44	143
3/ 8	TWILIGHT	13:17:42	4.9	ZC2809 (ψ SGR)	RD		223	33	301	23	145	-7	92
4/ 7	TWILIGHT	12:56:34	4.7	ZC3164 (UNKWN)	RD		301	28	309	22	133	-3	80
4/24	6:52:18	6:52:15	4.2	ZC1702 (ν VIR)	DD	096	113	81	145	54	229	-43	349
4/30	6:44:21	6:43:57	4.3	ZC2513 (UNKWN)	RD	280	266	74	227	13	130	-41	347
5/ 1	7:47:23	7:47: 8	2.9	ZC2672 (λ SGR)	RD	307	293	66	242	13	132	-41	7
5/24	9:27:06	9:27:57	4.3	ZC2033 (κ VIR)	DD	078	082	87	156	20	243	-28	33
6/ 4	9:17:20	MOONALT	4.7	ZC0005 (33 PSC)	RD	284		39	290	5	99	-28	30
7/27	10:02:05	10: 2:42	4.2	ZC3349 (τ_2 AQR)	RD	247	264	78	219	44	181	-26	40
7/31	6:42:09	MOONALT	4.7	ZC0249 (ν PSC)	RD	256		58	255	5	86	-37	345
8/16	MOON ALT	6:36:24	4.1	ZC2307 (ω_1SCO)	DD		107	57	103	5	242	-41	342
8/25	6:58:44	6:58:47	4.7	ZC3536 (30 PSC)	RD	201	214	85	207	40	134	-45	349
10/11	3:21:45	3:21:59	3.4	ZC2500 (θ OPH)	DD	113	103	37	67	11	231	-30	283
10/17	4:11:24	4:10:29	4.2	ZC3349 (τ_2AQR)	DD	047	031	78	140	43	172	-42	290
10/27	5: 7:17	MOONALT	3.2	ZC1030 (ε GEM)	RD	250		60	252	6	63	-55	299
10/28	6:32:20	6:32:47	3.7	ZC1170 (κ GEM)	RD	229	243	52	266	11	67	-68	335
11/ 9	1:16:33	1:17:53	2.1	ZC2750 (σ SGR)	DD	028	004	34	61	24	211	-10	257
11/ 9	2:01:05	1:35:41	2.1	ZC2750 (σ SGR)	RB	311	339	34	61	20	217	-17	261
11/15	0:38:57	TWILIGHT	4.7	ZC3536 (30 PSC)	DD	069		72	130	30	121	-3	250
12/24	UNKNOWN	7:28:21	3.6	ZC1484 (η LEO)	RD		260	65	243	35	92	-80	3

NOTES: REASON FOR NO LISTING IS SHOWN INSTEAD OF TIME WHERE DATA IS UNAVAILABLE.. BLANKS=NO LISTING AT THAT STANDARD STATION (PA). SUBTRACT 7 HOURS FOR CORRECT MOUNTAIN STANDARD TIME AND DAY. MAG=BRIGHTNESS MAGNITUDE OF STAR. PH=PHENOMENON,IE:RD=(R)EAPPEARANCE ON (D)ARK LIMB. PA=POSITION ANGLE OF STAR FROM NORTH POINT OF MOON (90=EAST). PS=PERCENT SUNLIT.

SAC Meeting and Observing Sites

General Meetings

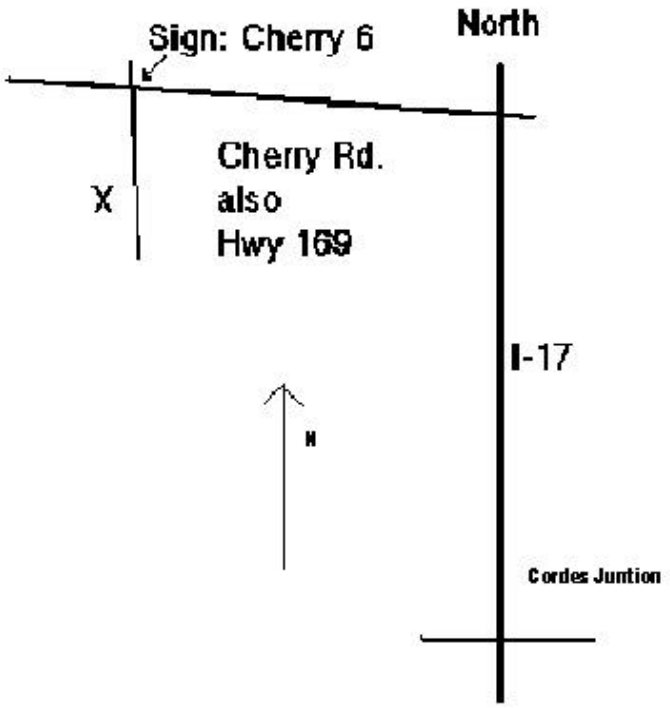
7:30 p.m. at Grand Canyon University, Fleming Building, Room 105: 1 mile west of I-17 on Camelback Rd., North on 33rd Ave., Second building on the right.



Flatiron Star Parties

Head west on I10 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 12 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. (see detail map above).

Cherry Rd. Star Parties



Take I-17 north to the Cherry Rd Exit, Hgwy. 169. Turn Left (west) onto 169 and go approximately 5 miles. You'll see a sign that says Cheery 6. Turn Left (opposite what the arrow on the sign says) onto a dirt road. Follow the dirt road about 1/2 mile. The site is through a gate on the right. Please keep the gate closed at all times.

SAC Membership Services

Membership

Memberships are for the following 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 (one newsletter)
$100.00	Business Membership (includes advertising)
$ 14.00	Newsletter only
$ 6.00	Nametag for Members

Subscription Services

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 treasure

$ 30.00/yr Sky & Telescope

r to renew your subscription.

$ 29.00/yr Astronomy

Please Print

Name:_____

Address:_____

_____

Phone;_____

Make Checks Payable to SAC

Mail Completed form to:

Peggy Kain
SAC Treasurer
P.O Box 30424
Phoenix AZ 85046-0424

E-mail (newsletter will be sent to this address):_____

Membership Renewal & Elections

As the year starts to wind down, it's time to think about renewing your membership. Although all memberships are valid through December, an early renewal can help our treasurer keep things running smoothly. An early renewal will also ensure your subscriptions to Sky & Tel & Astronomy continue uninterrupted. Both magazine experience a high volume of renewals around the end of the year and it has been noted that this backlog can delay processing of subscription renewals. So use the handy renewal form above and get your membership assured for next year.

On a related note, elections are also coming up, the process beginning in October. Now is the time to think about who will lead the club next year. The positions of President & Treasurer will both need to be filled as Jack & Peggy have served two years. The remaining officers still have one year of eligibility left.

Initial nominations will be held during the October General Meeting, followed by second nominations and final elections in November.

SAGUARO ASTRONOMY CLUB

January 2001

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Glendale, AZ 85308-9117

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Fax: 623-572-8575
Email: Saguaro Astro@aol.com

Videmus Stellae

DUES ARE DUE

As you know all memberships expire at the end of the year. If you haven't already done so, now is the time to renew your membership. You will receive two more issues of SACnews unless you renew, so send in you remittance now. Use the handy renewal form on page 13 of this newsletter.

www. saguaroastro.org

SAC Schedule of Events 2002

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 24th 2002	Nov. 15th 2002
June 21st 2002	Dec. 20th 2002 (Holiday Party)

Deep Sky Group Meetings

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

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