



Sacnews

Volume 28 Issue 1

January 2004

SAC Officers

President: Thad Robosson
602-826-0328

Starstarcraacker@qwest.net
Vice President: Jennifer Keller
480-967-1658

Starhopper@cybertrails.com
Treasurer: Al Stiewing
623-875-3969

amst@worldnet.att.net
Secretary: Joe Macke
623-979-8044

SaguaroAstro@azmacks.net
Properties: David Fredericksen
david.fredericksen@gmail.com.maricopa.edu
623-979-0513

Public Events:
Jack Jones
602-944-5488

Spicastar@cybertrails.com
Deep Sky Group: A. J. Crayon
602-938-3277

Acrayon@mindspring.com
SACNEWS Editor:
Rick Tejera, 623-572-0713

SaguaroAstro@aol.com
ATM Subgroup : Thad Robosson
602-826-0328

Starstarcraacker@qwest.net

Inside this Issue

2004- A Year of Sky Events	1
NASA's Space Place: So Little Time, So Many Galaxies	2
Last Call For Observations-Cassiopeia	4-5
Astro Bits	6
Calendar of Events	7
Lunar Occultations for 2004	8
President's Message	9
Member Services	10-11

2004: A Year of Sky Events

By Joe Orman

Mark your calendar for these interesting alignments, conjunctions, occultations, eclipses & meteor showers in the year 2004. Times are calculated for Phoenix, Arizona; other locations may differ. Most will be easy to see with the unaided eye, some very challenging -- take a look! Constructive comments and corrections welcome. This list may be copied and distributed for non-commercial use, but it must be credited to Joe Orman.

- ★ January 18 (morning): Bright star Antares (magnitude 1.1) 3 degrees to right of crescent Moon, in SE before sunrise.
- ★ January 19 (morning): Mercury 8 degrees to left of crescent Moon, low in SE before sunrise.
- ★ January 27 (evening): Mars 3 degrees to upper right of crescent Moon, high in WSW after sunset.
- ★ January 24 (evening): Venus 5 degrees to lower right of crescent Moon, in WSW after sunset.
- ★ February 9 - 10 (night): Gibbous Moon occults magnitude 2.8 star gamma Virginis (disappears behind bright side 12:25 a.m. MST, reappears from dark side 1:24 a.m.), high in SE.
- ★ February 23 (evening): Venus 4 degrees to lower right of crescent Moon, in W after sunset.
- ★ February 25 (evening): Mars 1 degree to upper right of crescent Moon, high in W after sunset.
- ★ March 7 (evening): Full Moon rises almost straight east in twilight (sunset 6:30 p.m. MST, moonrise 7:32 p.m., Moon 3 degrees up straight east at 7:51 p.m.).
- ★ March 11 - 12 (night): Gibbous Moon occults magnitude 2.3 star delta Scorpii (disappears behind bright side 12:32 a.m. MST, reappears from dark side 1:11 a.m.), low in SE.
- ★ March 19: Spring equinox (11:49 p.m. MST). Sunset straight west March 19 (6:39 p.m., azimuth 270.4 degrees), sunrise straight east March 20 (6:31 a.m., azimuth 89.3 degrees). Always use proper eye protection when viewing the sun.
- ★ March 24 (evening): Venus 3 degrees to lower right of crescent Moon, in W after sunset.

(Continued on page 3)



So Little Time, So Many Galaxies

By Dr. Tony Phillips

Fourteen billion years ago, just after the Big Bang, the universe was an expanding fireball, white hot and nearly uniform. All of space was filled with elementary particles and radiation. "Soupy" is how some cosmologists describe it.

Today the universe is completely different. It's still expanding-even accelerating-but there the resemblance ends. The universe we live in now is "lumpy." Great cold voids are sprinkled with glowing galaxies. In galaxies, there are stars. Around stars, there are planets. On one planet, at least, there is life.

How we got from there to here is a mystery.

Finding out is the goal the Galaxy Evolution Explorer, "GALEX" for short, a small NASA spacecraft launched into Earth orbit April 28, 2003. GALEX carries an ultraviolet (UV) telescope for studying galaxies as far away as 10 billion light-years.



This image of Messier 101 (M101), aka the "Pinwheel Galaxy," was taken in two orbits of GALEX on June 20, 2003. M101 is 20 million light years away.

"GALEX is a time machine," says astronomer Peter Friedman of Caltech. Because light takes time to travel from place to place, pictures of distant galaxies reveal them as they were in the past. "GALEX is investigating the evolution of galaxies over 80% of the history of our universe."

The Hubble Space Telescope can see faraway galaxies, too, but GALEX has an advantage: While Hubble looks in great detail at very small regions of the sky, GALEX is surveying the entire sky, cataloging millions of galaxies during its 2-year mission.

GALEX is a UV mission for a reason. Friedman explains: "UV radiation is a telltale sign of star birth." Stars are born when knots of gas condense in

interstellar clouds. The ones we see best are the big ones-massive stars that burn hot and emit lots of UV radiation. "These stars are short-lived, so they trace recent star formation."

Understanding star formation is crucial to studies of galaxy evolution. When galaxies collide, star formation surges. When galaxies run out of interstellar gas, star formation wanes. In galaxies like the Milky Way, spiral arms are outlined by star-forming clouds. The shapes of galaxies, their history and fate Š they're all connected by star formation.

Even life hinges on star formation, because stars make heavy elements for planets and organic molecules.

"Our measurements of UV radiation will tell us both the rate at which stars are forming in galaxies and the distances of the galaxies," says Friedman.

How did we get here? GALEX will show the way.

Find out more about GALEX at www.galex.caltech.edu. For children, visit The Space Place at spaceplace.nasa.gov/galex_make1.htm and make a beautiful galactic mobile while learning about some of the different shapes galaxies can take.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

(Continued from page 1)

- ★ March 25 (evening): Mars 1 degree to lower left of crescent Moon, high in W after sunset (occultation for northern North America, Iceland).
- ★ April 2 (evening): Venus in Pleiades star cluster, in W after sunset (Mars to upper left).
- ★ April 23 (evening): Crescent Moon, Mars and Venus make triangle within 8 degrees, in W after sunset (Mars to upper left of Venus mid-April through mid-May).
- ★ April 23: Comet C/2002 T7 (LINEAR) perihelion (closest to Sun). Closest to Earth May 19. Best viewing in morning twilight late April, in evening late May.
- ★ May 6: Comet C/2001 Q4 (NEAT) closest to Earth. Perihelion (closest to Sun) May 15. Best viewing early May through late May.
- ★ May 20 (evening): Venus 5 degrees to upper left of thin crescent Moon, very low in WNW after sunset (occultation in Europe, Africa, Asia), Mars and Saturn to upper left. Venus 5 degrees to lower right of crescent Moon on May 21.
- ★ May 22 - 26 (evenings): Mars less than 2 degrees to right or upper right of Saturn, in W after sunset. Venus to lower right.
- ★ June 8 (daytime): Venus transits sun (visible in Atlantic Ocean regions only; not visible from Western North America). Always use proper eye protection when viewing the sun.
- ★ June 30 - July 8 (mornings): Bright star Aldebaran (magnitude 1.1) is less than 1 1/2 degree to lower right or right of Venus, low in ENE before sunrise.
- ★ July 10 (evening): Mercury (magnitude -0.2) 1/4 degrees above Mars (magnitude 1.8), very low in WNW after sunset.
- ★ July 20 (evening): Jupiter 7 degrees to left of crescent Moon, low in W after sunset. Mercury to lower right.
- ★ July 24 (evening): Bright star Regulus (magnitude 1.3) 1 degree to upper right of Mercury (magnitude 0.4), very low in W after sunset.
- ★ August 12 - 13 (night): Perseids meteor shower. Crescent Moon rising after 3 a.m. will only interfere slightly. Shower radiates from constellation Perseus, which rises in NE about 10 p.m.. Best time to look between midnight and dawn. Typical rate 50 to 100 meteors per hour.
- ★ August 17 (evening): Jupiter 3 degrees to left of thin crescent Moon, very low in W after sunset.
- ★ August 31 - September 2 (mornings): Saturn 2 degrees to the upper left of Venus, in E before sunrise.
- ★ September 10 (morning): Bright star Regulus (magnitude 1.3) 1/3 degree to upper right of Mercury (magnitude -0.4), low in E before sunrise.
- ★ September 22: Fall equinox (9:30 a.m. MST). Sunrise straight east (6:17 a.m., azimuth 89.4 degrees), sunset straight west (6:24 p.m., azimuth 270.3 degrees). Always use proper eye protection when viewing the sun.
- ★ September 28 (morning): Full Moon sets straight west at sunrise (sunrise 6:21 a.m. MST, moonset 6:23 a.m.).
- ★ October 3 (morning): Bright star Regulus (magnitude 1.3) 1/4 degree to the lower left of Venus, in E before sunrise.
- ★ October 27 (evening): Total Lunar Eclipse, in E (moonrise at 5:33 p.m. MST, partial phase starts 6:16 p.m., totality from 7:25 p.m. to 8:43 p.m.).

(Continued on page 9)

Last Call For Observations—Cassiopeia

By A.J. Crayon

Welcome to the new SAC observing column. In reality this is not my column; instead it is yours, for you to submit observations and see them in printed form. The short explanation is – send your observations to me, I'll collate, format then send to our illustrious editor for inclusion into the SAC newsletter.

The first constellation is Cassiopeia, whose familiar five stars form the easily recognizable M or W pattern. But most miss the sixth, theta, which makes the throne upon which the beautiful queen of Ethiopia sits. Here we cover a number of open clusters that should be of interest to all observers.

Information on objects listed is from version 7.2 of the SAC database and was used to verify that NGC281 is also catalogued as IC11. Ken Reeves found it catalogued as IC1590. Checking the NGC/IC Project at <http://www.ngcic.org/gottlieb/default.htm> for resolution indicates all are correct, with the additional comment that IC1590 is just to the west of NGC281.

The submitters for this first column are Ken Reeves, Thad Robosson, Rick Rotramel and Rick Tejera. The formats were changed from what was originally requested and were necessary in order to keep from exceeding the columns two-page limit. If scope sizes were same, lowest power was listed first.

M 103, NGC 581 (01 33.4 +60 39)

Meade 8" F/6 at 48x; Rick Tejera: Fairly loosely packed, Shaped like an arrowhead pointing east. About 30 stars resolvable in cluster. Center of arrowhead basically empty, while the arrowhead itself is well defined. Several stars on periphery to the southeast.

10 inch F4.5 Dobsonian, 70X to 100X; Ken Reeves: Small, pretty bright, little condensed, with a nice grouping of stars including a nice wide yellow and blue on SE side, and blue star on NW. There are 5 levels of stars with about 20-30 stars counted. The range of stars and color contrast makes this a nice cluster.

20 inch F5 Dobsonian, 115X; Ken Reeves: Somewhat small, bright, rich, and condensed. There are 4 or 5 levels of stars with 47 stars counted, but there is no definite edge to the cluster. There are 4 bright stars including a deep blue and a very red star. The brightest stars form a dipper shape. The handle star is 3 in a row, very nice.

NGC 457 (01 19.5 +58 17)

Meade ETX 60 at 35X; Rick Tejera: Airplane shape is evident but not nearly as well define as with darker skies & aperture. Only about 4 stars define the fuselage and 3 each for the wings. The canard is not visible. The two bright stars at the end, ϕ Cas and H23 are prominent.

Meade 8" f/6 at 71x; Rick Tejera: Very nice cluster. To me this has the shape an airplane hdg SW. 8 stars make up the fuselage with chains of 6 stars and 4 stars making up the left and right wings respectively. The wings are swept back about 45 deg, There are about 4 stars perpendicular to the fuselage just in front of wing kind of like a canard. Two bright stars at the tail stand out from the rest at 5th mag giving the appearance of the engines on afterburner. The brighter of the two is ϕ Cas.

10 inch F4.5 Dobsonian, 70X; Ken Reeves: This is the Owl Cluster or Kachina Cluster. An absolute wow! The bright stars are white/yellow and white/blue. There are 5 levels of stars and many on edge of resolution. I had a star count of 76 stars plus more averted, not counting the 'feet' area. Very bright, pretty big, pretty well condensed, and elongated WNW/ESE.

15" f/5 Newtonian, 87x; Thad Robosson: Large cluster, moderately compressed, but heavily peppered with stars over an obvious background haze. About 70 stars counted, including a 4th and a 6th mag. pair on the South end. The cluster loosely resembles a fighter jet, and the 4th and 6th mag. stars are placed as the afterburners. Quite a few 9~12th mag. stars visible, averted brings out several fainter stars.

16" f 4.4 Newtonian; Rick Rotramel: Near two bright stars, pL, fRich, half dim/half bright stars, some pretty colors, "The Kachina Doll"

20 inch F5 Dobsonian, 115X; Ken Reeves: This is the Owl or Kachina Cluster. Very bright, pretty large, somewhat rich, and somewhat loose. There are 4 levels of stars with about 100 stars counted. The shape is unmistakable with 2 very bright (5 & 7 mag) yellow stars forming the eyes on the SE and strings going S and E forming the outstretched arms or wings. This is one of the most unmistakable clusters in the sky, a definite favorite to look at.

NGC 281, IC 11; cluster with nebulosity (00 53.0 +56 37)

Meade 8" f/6 at 71x; Rick Tejera: Very loose cluster. Main grouping of stars forms a headless arrow pointing west. Approx 20 stars visible in field.

10 inch F4.5 Dobsonian, 70X to 100X; Ken Reeves: The cluster (IC-1590) has a central star which is a nice triple and about 10 stars in middle which is presumably the cluster. The nebula responds quite well to the UHC filter. It is very large, and fairly bright around central star. To the S is a dark area almost forming a V. Some mottling and dark lanes are seen throughout the nebula. The NE side fades away pretty gradually. To the E of the cluster is a dark lane running N/S.

15" f/5 Newtonian, 147x; Thad Robosson: Loose, small cluster not well removed from the FOV. About 40 stars with a loose concentration and a hazy background (page 5)

(Continued from page 4)

the Milky Way. There is a chain of 5 stars leading roughly to the West.

16" f 4.4 Newtonian; Rick Rotramel: L, pF, ~ 20 stars, nebula shows well w/UHC filter, round w/notch on the south side, "The Pac Man"

20 inch F5 Dobsonian, 115X; Ken Reeves: The cluster (actually IC-1590) is bright, small, poor, and loose. There are 3 levels of stars with a count of 18 stars. The central area has a very nice triple star. The nebulosity is pretty bright, pretty large, basically round with wedge shape divots taken out of it. Using the O-III filter really brings it out. The obvious notch is to the SSE of the triple star and there is a dark area to the NE of the triple. Don't really see the pac-man shape.

NGC 663 (01 46.0 +61 15)

8" f/6 Newtonian, 55x; Thad Robossor: A "U" shaped cluster, somewhat loose, about 40 stars counted with direct vision, a few more picked up with averted. No haze underneath. NGC's 659 and 654 are just outside the field. Meade 8" f/6 at 71x; Rick Tejera: Very rich cluster. Main part of cluster elongated 2-1 N-S in two rows of more or less parallel lines. Second part of cluster to the NW of the main part, elongated a bit E-W. What seems to be nebulosity noted around the northern to central part of the main body of the cluster. Approx 40 stars within main part of cluster.

10 inch F4.5 Dobsonian, 70X; Ken Reeves: Very large and bright. There are 4 layers of stars with 45 stars counted plus some more stragglers. There are some nice double stars and many groupings of 2 and 3 stars. Being fairly close to NGC 659, it kind of reminds me of M35 and NGC 2158. A very nice cluster.

16" f 4.4 Newtonian; Rick Rotramel: L, B, Rich, ~25 bright stars with ~60 dim star group inside offset to the north side

20 inch F5 Dobsonian, 115X; Ken Reeves: Pretty bright, pretty large, somewhat condensed, and slightly rich. There are 3 levels of stars with about 120 stars counted. There is no real pattern, but there are some voids, the most obvious being the central void.

NGC 654 (01 44.0 +61 53)

10 inch F4.5 Dobsonian, 100X; Ken Reeves: Somewhat small, somewhat faint, pretty condensed, not very rich. There are 2 layers of stars, with 2 bright stars to S and many doubles, with about 20 stars counted.

16" f4.4 Newtonian; Rick Rotramel: fL, fB, Rich, nearly round, ~60 stars, some fainter, w/bright star on edge

20 inch F5 Dobsonian, 115X; Ken Reeves: Pretty small, somewhat faint, slightly poor, and pretty condensed. I saw 2 levels of stars and 2 bright field stars, with 32 stars counted not counting bright field stars. It is very well detached, much better than 659.

10 inch F4.5 Dobsonian, 100X Ken Reeves: Pretty bright, pretty small, fairly condensed. There are 3 levels of stars with 14 stars counted. To the SW are 2 bright stars and to the E is another bright star. The center of the cluster contains a ringlet of stars with one double. There is some background haze, which pops out during moments of good seeing.

16" f4.4 Newtonian; Rick Rotramel: fL, fB, Rich, triangle shaped, ~40 stars, with many dim stars

20 inch F5 Dobsonian, 115X; Ken Reeves: Pretty small, somewhat faint, pretty poor, and slightly condensed. There are 2 levels of stars with 33 stars counted. There are 2 bright stars to the WSW (mag 6 & 7), which interfere slightly. The cluster members are fainter than most of the surrounding field stars.

NGC7789 (23 57.4 +56 43)

Meade 8" f/6 at 71x; Rick Tejera: Very round Brighter toward the middle many dark lanes-Mottled throughout. 12 stars resolved around perimeter of 1st level of stars 6 more resolved in second level, mostly to the west.

8" f/6 Newtonian, 80x; Thad Robossor: The "White Rose", a very beautiful sight. Definitely resembles its title! NW quadrant, counted 15 stars, with many more averted vision. A very obvious haze underneath. Fairly tight cluster, but extended about 1/4 the FOV. Fairly easy to distinguish from the rest of the field. Dark and light portions make up the "petals" of the "rose". Can be said to appear like a spiral galaxy.

10 inch F4.5 Dobsonian, 70X; Ken Reeves: Very large, not real bright, very rich, and very compressed. There are 3 levels of stars over an extremely granular haze. Many stars resolve with averted vision and moments of good seeing. About 75 stars counted plus at least another 50 threshold stars. There are several voids in cluster.

15" f/5, 55x; Thad Robossor: WOW! This object is amazing! A very dense cluster filled with faint stars down to the threshold of visibility. The background is hazy with faint stars. Several dark lanes gives the cluster a "sworled" look that gives the impression of the "rose". Brightest stars in field are around 8th mag. With many in the 9th ~11th mag range. There doesn't appear to be any stronger concentration except for a short chain of just barely brighter stars just West of center.

16" f4.4 Newtonian; Rick Rotramel: L, pB, vRich, round, ~200 dim stars and ~35 brighter stars mostly on the south side, Nice!

20 inch F5 Dobsonian, 115X; Ken Reeves: WOW! Pretty bright, very large, extremely rich, extremely condensed, and well detached. There are 3 layers of stars, estimate about 300 stars by counting 75 in one quadrant. A somewhat bright star (mag 8) is on the W edge of the cluster. There are many chains and groups of stars and several prominent voids, the most obvious is a boomerang shaped void on the S.

Astro Bits

By Thad Robosson

A normal person sees weekends as a reprieve, a short break from the week's grind. Not that an amateur astronomy buff sees it much different, but for us, there is a bit more at stake. Yes, we can stay at home, and vegetate in front of the tube, but a good night or weekend observing does so much more for us, doesn't it? As I look back on 2003, I can only come up with a handful of memorable nights. Yes, the data shows that we had an "average" year regarding clear nights, but darn if I hit very many of them. And a few others I've discussed this with have the same opinion; the past couple years have not been too kind to us. But despite that, I hold out hope for the New Year. Within 30 minutes of getting my 2004 calendars, I was downloading sun and moon info for the upcoming year and writing it in the appropriate days on the calendar. While this is the first year I've done this, and thus, nothing to compare it to, I feel hopeful that this year will work out better. This year, there are 24 Saturdays available for us to observe. (Of course, some of us will also squeeze in Fridays and/or Sundays to add more possibilities.) 10 of those are "part niters", where the moon rises between 12 midnight and 3 a.m., and the other 14 are what I would consider "all niters", where the moon either sets very shortly after sunset, or does not rise until after 3 a.m. Here's the list I've worked out for my calendar. (Please note that any times given are for my home in Avondale, and are only approximate for other locations.)

Part Niters:

February. 14th (Singles night. Married people come at your own risk.); March 13th; April 10th; May 8th; June 12th; July 10th; August 7th; October 9th; November 6th; December 4th

All Niters:

January 17th ; January 24th (Moonset 51 minutes after end of twilight.); February 21st; March 20th (Moonset and Sunset at the same time!); April 17th (Post-tax day therapy session) May 15th; June 19th (Moonset 14 minutes after end of twilight); July 17th (Moonset 2 minutes after end of twilight. Moon is only 15 hours, 16 minutes old.); August 14th; September 11th; September 18th (Moonset 1 hour, 8 minutes after end of twilight.); October 16th (Moonset 27 minutes after end of twilight.); November 13th (Moonset 33 minutes before end of twilight.); December 11th (Moonset 1 hour 52 minutes before end of twilight.)

It seems to me that we are indeed getting some good chances this year, even without resorting to wishful thinking! Just looking at the list above, it appears that several new moons this year fall near a Saturday, giving us additional opportunities with a 3rd quarter and new moon weekends back-to-back. I also see that January and September give us not one, but two weekend all-niter opportunities. (Let's start planning that loooooong Astro weekend now!) And with that, I wish all of us a very productive Astro-year free of clouds, bugs, forest closures, and gas shortages.

February 2004

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						

Schedule of Events for January & February 2004

Jan. 7th	Moon is full at 1540 mst
Jan. 9th	SAC General Meeting at Grand Canyon University at 1930, Speaker Dr. Fulvio Melia of the U. of A. His topic will be the Black Hole at the center of the Milky Way. This meeting will be preceded by a board meeting. Please feel free to attend.
Jan. 15th	Moon at last quarter at 0446 mst.
Jan. 17th	SAC Star party at Flat Iron Mountain Site. Sunset 1747, Ast. Twi. Ends 1915 Moonrise 0429.
Jan. 21st	Moon is new at 2105 mst.
Jan. 29th	Moon at first quarter at 0603 mst.
Feb. 3rd	ATM Subgroup meeting at Thad's shop. Contact Starstarcracker@qwest.net or call 602-826-0328 for details & directions
Feb. 6th	SAC General Meeting at Grand Canyon University at 1930. Speaker: Paul Knauth, topic TBA
Feb. 6th	Moon is Full at 0847 mst.
Feb. 13th	Moon at last quarter at 1340 mst.
Feb. 14th	SAC Star Party at Flat Iron, Sunset: 1814, Ast Twi. End: 1938, Moonrise: 0327
Feb. 20th	Moon is New at 0918 mst.
Feb. 28th	Moon at First Quarter at 0324 mst.

Future Planning

Mar 20-21st	2004 All Arizona Messier Marathon at Arizona City. For more information contact A.J. Crayon at acrayon@mindspring.com or go to: http://www.saguaroastro.org/content/messier.htm
Jun 12-19th	Grand Canyon Star Party. Go to: http://www.tucsonastronomy.org/qcsp.html for more information

Lunar Occultations for 2004

Calculated & Compiled by Brian Vorndam

DATE	TIME (1)	TIME (2)	MAG	STAR INFORMATION	PH	PA1	PA2	PS	ELG	MA	MAZ	SAL	SAZ
1/31		2:41:16	4.5	ZC0599 (37 TAU)	DD		60	64	116	3	295	-59	67
2/10	0:26:26	0:25:45	2.9	ZC1821 (γ VIR)	DB	84	96	74	227	32	115	-71	349
2/10	1:26:06	1:25:13	2.9	ZC1821 (γ VIR)	RD	350	334	74	227	42	128	-69	31
2/14	4:40:53	4:40:25	4.8	ZC2347 (UNKNOWN)	RD	270	250	45	278	23	142	-32	85
3/8	21:49:12	21:47:51	4.4	ZC1891 (θ VIR)	RD	256	246	85	207	14	106	-41	297
3/12	0:38:23		2.5	ZC2290 (δ SCO)	DB	56		63	247	6	122	-60	1
3/12	01:07:59	01:11:48	2.5	ZC2290 (δ SCO)	RD	359	336	62	248	11	126	-59	16
4/10	1:19:15		4.4	ZC2554 (ξ SGR)	RD	283		61	250	10	132	-47	19
4/15		5:37:59	4.2	ZC3349 (τ_2 AQR)	RD		210	23	319	16	118	-4	75
6/4	4:22:18	4:23:08	4.7	ZC2617 (UNKNOWN)	RD	234	246	85	207	19	216	-10	54
7/29	0:14:50	0:14:46	4.7	ZC2617 (UNKNOWN)	DD	110	101	84	151	22	210	-38	355
8/3	2:40:18	2:17:23	4.6	ZC3425 (ϕ_2 AQR)	RD	269	298	79	218	47	170	-32	33
8/27	00:28:48		4.8	ZC2910 (UNKNOWN)	DD	359		82	148	21	215	-46	0
8/27	1:32:15	1:31:22	5	ZC2914 (60 SGR)	DD	49	31	83	149	13	226	-44	22
9/26	20:14:18		4.6	ZC3425 (ϕ_2 AQR)	DD	352		92	165	29	125	-25	285
10/18	20:13:36		4.7	ZC2617 (UNKNOWN)	DD	15		39	71	11	225	-31	279
10/29	3:56:50	3:38:06	4.5	ZC0465 (UNKNOWN)	RD	307	315	90	198	53	259	-37	82
11/1		6:36:06	4.5	ZC0890 (UNKNOWN)	RD		246	69	237	52	274	-3	106
11/3	2:35:09	2:35:40	4.2	ZC1149 (ν GEM)	RD	312	324	56	259	56	91	-52	70

NOTES:

BLANKS=NO LISTING AT THAT STANDARD STATION (TIME & PA).

TIMES ARE MOUNTAIN STANDARD TIME

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.

ELG=ELONGATION OF MOON FROM SUN (180=FULL, 270=3RD QUARTER).

MA=MOON ALTITUDE (90=DIRECTLY OVERHEAD).

MAZ=MOON AZIMUTH (90=EAST).

SAL, SAZ=SUN ALTITUDE, AZIMUTH.

President's Message



Things keep changing. I've seen 3 great presidents serve this club since I joined in 1997, and now I'll get a change in perspective as I serve that post for the next 2 years. I am excited about my upcoming duties, and look forward to doing my part to keep the spirit of SAC alive, and hopefully grow it a little in the process. I am also excited about serving with the new board.

There have been a couple of ideas tossed around already, and the first board meeting should be a great start to the year. But more importantly, I look forward to finding new ways and coming up with new ideas to benefit SAC and its membership. Coming into this position, SAC is one of the premier astronomy clubs, and the only thing I want to change about that is to make it even more so during my term.

Thad Robosson

(Continued from page 3)

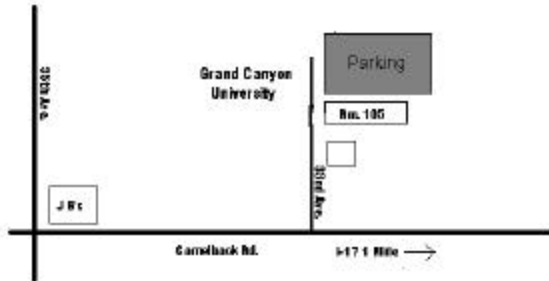
- ★ November 4 (morning): Jupiter 1/2 degree to lower right of Venus (3/4 degree to the right of Venus on November 5), in E before sunrise.
- ★ November 5 - 6 (night): Last-quarter Moon occults magnitude 3.5 star eta Leonis (disappears behind bright side 2:09 a.m. MST, reappears from dark side 2:38 a.m.), in E.
- ★ November 9 (morning): Jupiter 1 degree to lower right of crescent Moon, Venus and Mars below, in ESE before sunrise (Moon occults Jupiter in northern and eastern North America).
- ★ November 10 (morning): Vertical alignment within 20 degrees: Jupiter, Venus, thin crescent Moon, and Mars, in ESE before sunrise (Moon occults Venus in Asia and Australia November 10, Mars in Africa and Australia November 11).
- ★ November 17 - 18 (night): Leonids meteor shower. First quarter Moon setting about 11 p.m. will not interfere. Shower radiates from constellation Leo, which rises in E about midnight. Best time to look between midnight and dawn. Typical rate 20 meteors per hour, some years much higher.
- ★ December 5 - 6 (mornings): Mars 1 1/4 degrees to lower right of Venus, low in ESE before sunrise.
- ★ December 7 (morning): Jupiter 1 1/2 degrees to upper right of crescent Moon, high in SE before sunrise (occultation for much of North America).
- ★ December 9 (morning): Venus 8 degrees to lower left of crescent Moon, Mars between them, low in ESE before sunrise.
- ★ December 13 - 14 (night): Geminids meteor shower. Crescent Moon setting about 7 p.m. will not interfere. Shower radiates from Castor in constellation Gemini, which rises in NE around 7 p.m. and is near zenith in early morning hours. Best time to look between 9 p.m. and dawn. Typical rate 60 meteors per hour.
- ★ December 27 - 31 (mornings): Mercury less than 1 1/2 degrees to the upper left of Venus, very low in ESE before sunrise.

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

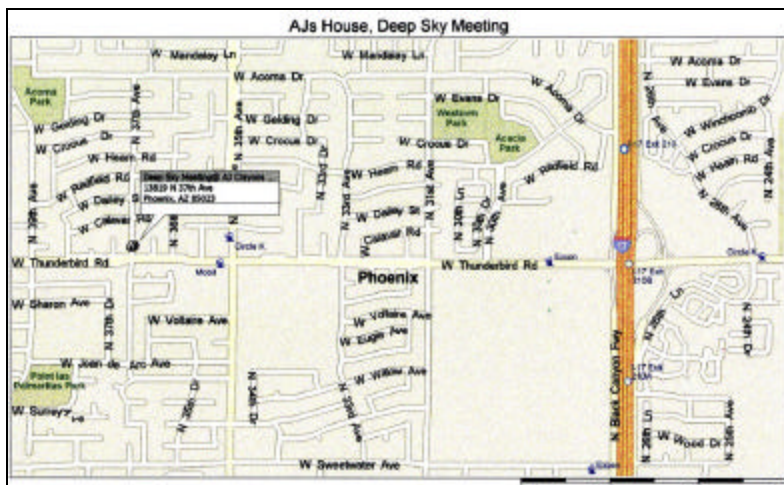
SAC Meeting and Observing Sites

General Meetings

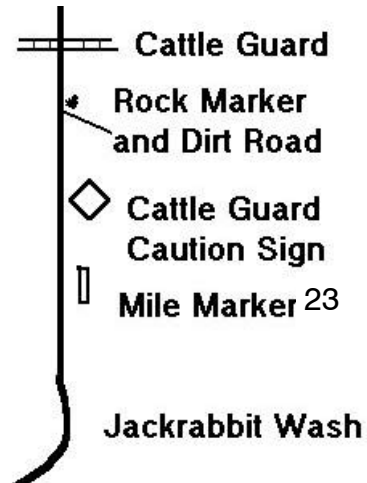
7:30 p.m. at Grand Canyon University, Fleming Building, Room 105: 1 mile west of I-17 on Camelback Rd., North on 33rd Ave., Second building on the right.



Deep Sky Group Meeting



Flatiron Star Parties



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. (see detail map above).

A Call For Observations Objects for February

The January column is closed, We have plenty of observations. Now on to February and Perseus. Here are the objects to observe:

- M76 - The Little Dumbell.
- NGC957 - an open cluster from the Urban List.
- NGC1023 - a very bright galaxy.
- NGC1245 - an open cluster from the Herschel 400 list.
- NGC1275 - Perseus Galaxy Cluster - listed as faint.
- NGC1491 - bright nebula from the 110 Best NGC.
- NGC1582 - large bright open cluster.
- NGC1605 - small open cluster.

Please have your observations submitted to AJ or Rick by January 15th. 2004 to ensure they'll be included.

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 \$33.00/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: _____

City: _____ St: _____ Zip: _____

SAC Treasurer
c/o Al Stiewing
16210 Desert Holly Dr.
Sun City, AZ 85351

Phone: _____

- Check here if this is an update of information already on file.

E-Mail:

SAC on the Internet

SAC has several E-mail mailing lists. To subscribe, send an email to the email address and put **Subscribe** in the subject box.

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 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.

Printed 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 you prefer a printed copy.

- Please send me a hard Copy of the newsletter

SAGUARO ASTRONOMY CLUB

January 2004

5643 W. Pontiac Dr
Glendale, AZ 85308-9117

Phone: 623-572-0713
Fax: 623-572-8575
Email: SaguaroAstro@aol.com



Videmus Stellae



SAC Schedule of Events 2004

SAC Meetings

Jan 9th, 2004	Jul 2nd, 2004
Feb 6th, 2004	Jul 30th, 2004
Mar 5th, 2004	Aug 27th, 2004
Apr 2nd, 2004	Sep 24th, 2004
May 7th, 2004	Oct 29th, 2004
Jun 4th, 2004	Nov 19th, 2004

Deep Sky Group Meetings

Jan 15th, 2004	Jul 8th, 2004
Mar 11th, 2004	Sept 2nd, 2004
May 13th, 2004	Oct 4th, 2004

SAC Star Parties

Date	Sunset	Astronomical Twilight Ends	Moonrise	Site
Jan 17, 2004	1747	1915	0429	F
Feb 14th, 2004	1814	1938	0327	F
Mar 13th, 2004	1839	2002	0328	F
April 10th, 2004	1859	2025	0124	F
May 15th, 2004	1924	2103	0404	C
June 12, 2004	1942	2127	0234	C
Jul 10th, 2004	1943	2126	0105	C
Aug 7th, 2004	1924	2058	2335	C
Sep 11th, 2004	1840	2005	0405	C
Oct 9th, 2004	1804	1927	0256	F
Nov 6th, 2004	1734	1859	0141	F
Dec 4th, 2004	1723	1851	0027	F

F= Flat Iron; C= Cherry Road