

NASA Space Place

Apollo Upgrade

The flight computer onboard the Lunar Excursion Module, which landed on the Moon during the Apollo program, had a whopping 4 kilobytes of RAM and a 74-kilobyte "hard drive." In places, the craft's outer skin was as thin as two sheets of aluminum foil.

It worked well enough for Apollo. Back then, astronauts needed to stay on the Moon for only a few days at a time. But when NASA once again sends people to the Moon starting around 2020, the plan will be much more ambitious—and the hardware is going to need a major upgrade.

"Doing all the things we want to do using systems from Apollo would be very risky and perhaps not even possible," says Frank Peri, director of NASA's Exploration Technology Development Program.

So the program is designing new, more capable hardware and software to meet the demands of NASA's plan to return humans to the moon. Instead of staying for just a few days, astronauts will be living on the Moon's surface for months on end. Protecting astronauts from harsh radiation at the Moon's surface for such a long time will require much better radiation shielding than just a few layers of foil. And rather than relying on food and water brought from Earth and jettisoning urine and other wastes, new life support systems will be needed that can recycle as much water as possible, scrub carbon dioxide from the air without depending on disposable filters, and perhaps grow a steady supply of food—far more than Apollo life-support systems could handle.

Next-generation lunar explorers will perform a much wider variety of scientific research, so they'll need

vehicles that can carry them farther across the lunar surface. ETDG is building a new lunar rover that outclasses the Apollo-era moon buggy by carrying two astronauts in a pressurized cabin. "This vehicle is like our SUV for the Moon," Peri says.

The Exploration Technology Development Program is also designing robots to help astronauts maintain their lunar outpost and perform science reconnaissance. Making the robots smart enough to take simple verbal orders from the astronauts and carry out their tasks semi-autonomously requires vastly more powerful computer brains than those on Apollo; four kilobytes of RAM just won't cut it.

The list goes on: New rockets to carry a larger lunar lander, spacesuits that can cope with abrasive moon dust, techniques for converting lunar soil into building materials or breathable oxygen. NASA's ambitions for the Moon have

been upgraded. By tapping into 21st century technology, this program will ensure that astronauts have the tools they need to turn those ambitions into reality.

Learn more about the Exploration Technology Development Program at www.nasa.gov/directorates/esmd/aboutesmd/acd/technology_dev.html. Kids can build their own Moon habitat at spaceplace.nasa.gov/en/kids/exploration/habitat.

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



The Chariot Lunar Truck is one idea for a vehicle equal to the lunar terrain. Each of the six wheels pivot in any direction, and two turrets allow the astronauts to rotate 360°.

Pretty cool stuff. The limited view from my balcony and the bright (40 miles crow fly from Manhattan) kind of dampened my enthusiasm, although I kept reading what I could and if there was something interesting happening in the southern sky, I'd take a look. It would be 4 more years before the big OOOOHHHH Moment.

That OOOOHHHHH moment came in 1995 when we moved to Arizona. Our house in Arrowhead Ranch was actually at the time in relatively dark skies, at least compared to Ronkonkoma (remember Ronk-Onk-O-Mah). Unfortunately, being low man on the totem pole at my new job meant nights. That couple with pregnancy (Sue's, not mine), tempered the newfound enthusiasm. I did manage to get to one of the Thunderbird Star parties (Before there were houses next to the observing field) and spoke with a few members (Adam Sunshine & Ken Reeves, Adam, about the club as he was president then, and Ken because he his 20" out). They were both encouraging and unknowingly re-lit the bug. Few recommendations and I decided an 8" DOB would fit my urge and not be too expensive. I stated to save my spare money and that along with some birthday & Christmas money, Gert was purchased from the Astronomy Shoppe (remember that place?). First light was on the Orion Neb-

ula, the first really good look I had of it. About a week later I attended the Thunderbird Event with Hale Bopp at closest approach & a total Lunar eclipse. I wasn't a member yet and had asked someone if I'd be stepping on any toes if I brought my new scope. I was told it would be more than welcome as they were expecting a really large turnout. That was an understatement, people were parking 1 mile away at Pinnacle Peak & 55th Ave and hoofing it up the mountain to the observing site for a look. If memory serves we, had well over 1000 guests that night!

I became a member shortly thereafter. Membership in SAC has been the best astronomical investment I've made to date. When I was starting out, there was always an encouraging word or good advice from the more experienced members when I couldn't find something. I find it kind of ironic that now I'm one of the guys, newcomers ask for advice. I'm always glad to help, as folks like AJ, Ken, Steve (both Coe & Dodder), Rich Walker Tom Polakis, and many others did for me. As much as I enjoy looking at ancient photons, it just wouldn't be as much fun without sharing it with fellow SAC members.

Bits & Pisces, Minutes of the February 6th, 2009 General Meeting by AJ Crayon, Secretary



The meeting was called to order by the President and he requested visitors introduce themselves. Three folks did so. A head count indicated 44 people in attendance. First order of business was a discussion of the

International Year of Astronomy 2009 (IYA2009) There were several possibilities proposed, amongst them were planning a star party at the *Arizona Science Center* and other public star parties. A calendar of events was discussed. For more information see Steve Dodder and Chris Hanrahan.

Upcoming events, that have yet to transpire are; March 3rd, ATM sub group at Paul Lind's, March 6th, SAC meeting, March 28th, 2009 All Arizona Messier Marathon and April 7th, SAC meeting.

AJ Crayon presented three observing awards. They were, and went to; Urban List, David Cooper arm sling and all; Herschel 2, Joe Goss; 1000 Objects, David Holland who came to the meeting from Alabama just for the award and got a standing ovation. Nice job all 3 of you and keep up the work!

For Show-n-Tell Steve Coe gave a short presentation chronicling his big trip to Iowa to pickup his motor home and drive back to Valley of the Sun.

Novice Group Chairman Steve Dodder showed plans for a 6'

solar observatory, and discussed some plans for IYA2009. This was followed up with the Grand Canyon Star Party at the North Rim, which is scheduled for June 13th thru the 20th. He discussed setting up on the veranda, parking, facilities and logistics. If you are interested see Steve for more information.

Chris Hanrahan, our Vice President and School Star Party Coordinator, announced Astronomy Day is May 2nd and is planning on a star party, perhaps, at the Arizona Science Center.

Charlie Whiting gave a treasurer's report. Our income was \$1456.00, expensed \$699.00 and assets were \$4269.00. There were 92 members on the roster, 50 having paid dues and 4 honorary members.

Tom Polakis had a presentation on Messier Marathons, but not your annual type. It was how one might go about doing the Messier Catalog numerically. Yes, start at M 1, proceed to M 2, then M 3 and so on until you bag all 110. The process takes about 5 nights.

After the break, Vice President Chris Hanrahan introduced the evening's speaker. He is Dean Salmon and the topic was Remote Automated Observatories for CCD Imaging. During his presentation he connected to his web site and performed some real-time demonstrations. For more information see the following web site - <http://CCDImages.com>



Call For Observations–Orion

By A.J. Crayon

This is second time around visiting the *Great Hunter*, the first being back in 2004. Turns out some of the selections were so good plus the weather wasn't very cooperative. Hence the Barnard nebula will be put back into the unobserved list, possibly used for a future visit. Another situation I have struggled with from time to time is when multiple objects are in the same field and such is the case with the *Running Man Nebula* which includes NGC1973/75/77. Here some of us provided an observation of each individual element and others provided one observation for everything. Here the format of the observers submission has been followed and it is hoped this will no cause to much confusion. Let me know what you think about this kind of observation.

The objects this month started with **Cr 65**, a large, sparse open cluster with a wide magnitude range that straddles the border with Taurus.

10X50 Binoculars; Dick Harshaw: It looks nice in the spotter (it is far too large for a telescope). I counted 15 stars.

60mm f/5.8 ETX at 18x: Rick Tejera: Seen as a loose grouping of stars, mostly running in an E-W line with several detached groups to the N & S There is an interesting triple star near the western edge of the field. A slight glow of unresolved stars near the center, or was this averted imagination?

Just to the south are some dark nebulae, three to be exact. The first **B 30**, is about one degree; second **B 31** extends about 0.5° to the northeast and is the darker part of the triad; finally **B 225** is the south end of an extension running south from B 30. With their irregular shape you should have fun unraveling this set. No observations submitted, perhaps because a better selection could have been provided.

Continuing with multiple objects in the same field of view are **NGC1973**, **NGC1975** and **NGC1977** and have the moniker *Running Man Nebula*. Keep in mind NGC1973 and NGC1975 are north of the elongated NGC1977 and NGC1973 is west of NGC1975. There are, also, a number of stars involved with these nebulae. As in the past, observers have used different methods to record their observations. Some have used one set to describe multiple objects in the field of view, others have used an observation for each. Without causing too much confusion, the observations have been inserted as submitted. Rick Rotramel and I used one observation for all 3, yet some years ago, in my 8", one observation was used for each.

Running Man Nebula

14.5" f5.2, Dobsonian, 140X; AJ Crayon: There are three groupings of nebulosity, in a triangular pattern, with a number of stars involved. First is **NGC1973**, some nebulosity to the Northwest. Next is **NGC1975**, the faintest nebulosity to the north. Last, to the south, is **NGC1977** the cluster involved in nebulosity and is the largest and brightest of the trio. *NGC1977* has 3 stars in an easterly position that includes 42 and 45 Orionis and 12 others from 6th to 12th mag. The elongated nebulosity is also in an easterly position and better defined to the north. It is about 20'X10'. The bright nebulosity, *NGC1973* is about 5'. It has 3 stars involved, of 7th and 8th mag, in a line positioned to the northeast. I would characterize *NGC1975* as faint nebulosity and about 10'. It's Orion, what do you expect. It is worthwhile to consider this a do-over after doing some research. Since this is just to the north of M 42 is it considered part? Next time check out the view in the 9X50 finder.

16" f4.4 Newtonian, 90x; Rick Rotramel: E/RN - fL, fB, nebulous glow around ~10 bright stars. There are three levels of intensity, the brightest around two bright stars, the next two levels are the top and bottom of the object. Dark nebula creates a silhouette of a man running with arms outstretched. It resembles the trademarked image of the FTD flower company. The head is the darkest part of the dark nebula, with the arms and legs being fainter. !!! A splendid object. * In the winter I judge nights of good seeing and transparency by how well this object appears. In the summer skies I use M20, The Trifid Nebula.

NGC1973

8" f/6 Dobsonian, 80x: Rick Tejera: Seen With NGC 1975 & NGC 1977, the smaller of the two nebula within NGC 1977. Elongated about 2-1, there are two stars on either end of it and one detached piece of nebulosity surrounding what I believe to be KX Ori

8" f6, Newtonian, 100X; AJ Crayon: 10'X5', 10th mag; a 3'wide semi-circle with a 9th mag star involved at each end. The field has 9 stars 9th to 12th mag and THE GREAT NEBULA at north edge of field!

8" SCT, 104X; Dick Harshaw: The greenish color of this nebula is very pronounced, and the nebula is quite bright, being lit by KX Ori. At high powers, some of the stars that light it begin to peep through. It has a footprint shape.

13" f5.6, Newtonian, at 100X; Steve Coe: little round nebula on the north side of NGC1977, I see a bridge attaching them together. It is not much, a little blob with

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one 9th mag and two 11th mag. stars involved.

NGC1975

8" f/6 Dobsonian, 80x: Rick Tejera: Seen with NGC 1977 & 1973 in the same field. This is the larger of the two bright nebula, Elongated about 4-1 E-W Surrounding one of the groups of stars in NGC 1977. Pretty bright and uniform in brightness throughout, fading a bit to the west.

8" SCT, 83X; Dick Harshaw: The open cluster inside this nebula is very rich. The nebula itself is extremely faint.

13" f5.6, Newtonian, at 100X; Steve Coe: double star 10-10 mag with about 10 arc-sec separation with fuzz from NGC1977, not much of an object to get separate NGC number.

NGC1977

8" f/6 Dobsonian, 80x: Loosely packed Cluster amid the Bright Nebula NGC 1975 & 1973. Seen as several loose groups of about 4 to 5 stars each surrounded by the above mentioned nebulae.

8" SCT, 83X; Dick Harshaw: The illuminating cluster is very rich, while the nebula is extremely faint, being brightest in the S portion.

11" SCT, 98X; Dick Harshaw: The view in the 11-inch SCT was not much better than in the 8-inch SCT years earlier! Rich cluster but faint nebula, brightest in the south section.

13" f5.6, Newtonian, at 100X; Steve Coe: bright, large, elongated 2X1 in PA 0, nebulosity with 8 stars involved. 3 of the stars are bright, mags 6-7, 5 others are 9...11. The nebulosity is brightest on the west side. The UHC does not help.

The planetary nebula, **NGC2022**, was next. A request for observing any annular form didn't seem to draw any responses yet color was reported. Looks like only AJ saw blue, Dick and Steve called it green. Charlie abstained.

8" f6, Newtonian, 60X; Charlie Whiting: a very small PN, was detected. Pretty dim, 12th mag. Observed at **240X**. Diameter observed about 10". Data says 18". Likely all that I could see in an 8" telescope was a core. Tried a narrow band filter. The nebula seemed a little larger, but fuzzier. Suspect the filter changes the focus a tiny bit. Hard to focus **240X** on a night of mushy seeing.

8" f/6, Dobsonian, 80x: Rick Tejera: O-III filter: Seen as bright and somewhat irregular in shape. Fairly uniform in brightness throughout with a sudden brightening in the middle.

8" f6, Newtonian, 100X; AJ Crayon: 15" diameter, UHC helps a little, darkens field, round, blue and a little brighter with averted vision.

8" SCT, 206X; Dick Harshaw: It looks like a fuzzy star, with a hint of a ring at high powers. It has a strong green color. You'll need to use high powers, because at anything less than 104X, it looks like one of the field stars. A pair of 8th mag and 9th mag stars lies 10 min WNW. The central star is 14.7 mag. It was discovered by William Herschel in 1785.

13" f5.6, Newtonian, 100X; Steve Coe: It was spotted at 100X, the central star was never seen, just a brightening in the middle. I called the color gray. At **220X** it is pretty bright, pretty small, little elongated 1.5X1 in PA 0. There is no central star at 220X. **330X**--some difficult structure is seen, mostly averted vision only. The east side is consistently brighter than the west side. There are brief glimpses of a stellar spot offset to SE. All this detail is at the limit of the 13". Using my old 17.5" Dobsonian at **200X** I observed that this planetary was greenish.

Finally there's **NGC2024** also called *Tank Track Nebula* or *Flame Nebula*. It is bright but the glow of its source stars, zeta Orionis, needs to be masked to see the delicate detail.

8" SCT, 37X; Dick Harshaw: Large and faint; I found it best to set the scope just W of it and turn off the clock drive, letting it "sneak" into view. There is a dark band across the center, and Zeta Ori is a pest! A narrow band filter is a tremendous help on this nebula.

8" f/6 Dobsonian, 80x: Rick Tejera: With ζ Ori at the edge of the field there were three separate parts of the nebula, each elongated between 3-1 & 2-1 the center section was the brightest and largest. The section furthest from Zeta Ori was barely perceptible. The inner section had what looked to be a brighter bar like knot in the center parallel to the long axis.

8" f6, Newtonian, 100X; AJ Crayon: 30' bisected by dark lane in northern direction, with east and west extensions on each side. The UHC is no help. Best observed with the bright ζ Orionis, Alnitak, out of the field.

16" f4.4 Newtonian, 70x; Rick Rotramel: EN - pL, pB, a nebulous glow with dark nebula bisecting the glowing ionized hydrogen to create an image nearly of a tanks' track on the ground. Right next to the bright star Zeta ORI, one must put the star out of the field to enjoy this fine object. Pretty!

Variety of telescopes; Steve Coe: It is easy in any telescope I have ever used under dark skies and my old **8" f/6** would show several dark lanes winding across this nebulosity. The **17.5"** brings out much detail in the region at 200X. Using the **13" f/5.6, 135X** with a UHC filter helps the contrast a lot and so does getting Zeta out of the field. Because of the large, parallel dark lanes, Arizona astronomers have taken to calling NGC 2024 the "*Tank Track*" Nebula.

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President's Corner

By Dick Harshaw

On Deficits and Stimulus Packages



There once was a pastor of a small church who felt he needed to preach on giving money, a touchy subject in many churches. He was particularly apprehensive, because the head deacon, a silver-haired old geezer who always sat in the front row, held great political power in the church and was generally known to oppose sermons on giving.

The great day came and the pastor began his homily: "Before a church can do anything, it must learn to crawl."

At that, the old deacon piped up, "Hear, hear, Rev. Make it crawl, make it crawl!"

Feeling encouraged, he went on: "After a church crawls, it has to walk."

The deacon cheered, "Make it walk, Rev, make it walk!"

"After it walks, a church has to learn to run."

"Oh, amen, Rev! Make her run, make her run!"

Then the big moment: "And to run, a church has to have money."

The old deacon said, in a flat voice, "Oh, heck, Rev- let her crawl, let her crawl."

I sort of feel a little like that pastor. SAC's cash out-goes will exceed incomes this year, meaning we will be operating in a deficit. If you are the government, you can do that by foisting off the bills on an unborn generation, but we can't. We will come out \$900 or so short by Charlie Whiting's careful calculations.

The board is exploring a number of options. One is

the making and selling of new T-shirts. The board has authorized Jack Jones to pursue this. If the sales are like they have been in past years, we should realize nearly \$500 profit. That's a great start!

Steve Dodder is exploring the idea of a 50/50 pot at each meeting-- members buy "tickets" for \$1 each and at the end of the meeting, the winning ticket is drawn out of a bucket. The winner gets half the pot, the club gets the other half. I have conservatively estimated that we would net about \$25 per meeting for the club (maybe more, but I'm playing it safe here). Figuring about 10 pots a year, that's about \$250 for the club.

We're up to about \$750 of our \$900 deficit.

The other option we are exploring is raising dues. This will be discussed in the April general meeting, so be sure to come if you have questions. Currently, your dues (\$28.00 a year) amount to a whopping 7.67 cents a day. Heck, it would take almost two months to buy a single cup of coffee at Starbuck's at that rate! If we went to 9.86 cents a day, we'd close our deficit and be in good shape for 2010. We're also considering new dues classes, but more on that at the meeting.

Now think what all you get for less than a dime a day: membership in one of the most prestigious OBSERVING clubs in America, the most complete and pace-setting library of object databases in the amateur community (our databases being incorporated in almost every major astro software package), access to superb observing sites and wonderful star parties, great friendships, the chance to rub shoulders with some of the most prolific observers anywhere, engaging speakers and programs, and porta-potties at major events.

You can't beat it with a Schmidt!

So come to the April meeting and hear the board grovel and beg for more funds. You'll be glad you helped out and kept SAC solvent for generations of astronomers yet to look upward.

April 2009

SUN	MON	TUE	WED	THU	FRI	SAT
			1	2 ☽	3	4
5	6	7 ATM Meeting 1930, Paul Lind's House	8	9 ○	10 SAC Meeting, GCU 1930	11
12	13	14	15	16	17 ☾	18 SAC Star Party at Saddle Mountain
19	20	21	22	23	24 ●	25 DOTM Star Party, Antennas
26	27	28	29	30		

Schedule of Events for March 2008

April 2nd	Moon at First Quarter at 0733mst.
April 7th	ATM Sub group meeting at Paul Lind's house
April 9th	Moon is full at 0755mst..
April 10th	SAC Meeting at Grand Canyon University at 1930, Speaker TBA
April 17th	Moon at Last Quarter at 0635mst.
April 18th	SAC Star Party at Saddle Mountain: Sunset 1905, Ast. Twilight 2033, Moon rise 0246, 6Hrs, 13 min of Dark time
April 24th	Moon is new at 2022mst
April 25th	DOTM Star Party at the Antennas: Sunset 1913, Moonset 2022, Ast. Twilight ends 2043, Ast. Twilight Begins 0421, 7 Hours 38 minutes of Dark time

Future Planning

May 2nd	Thunderbird Star Watch, Thunderbird Park, Glendale
June 13th-20th	Grand Canyon Star Parties, South & North Rims, For the South rim go to: http://www.tucsonastronomy.org/gcsp.html , For the North Rim, go to: http://www.saguaroastro.org/content/2009GrandCanyonStarPartyNorthRim.htm

Monthly Trivia Question

How did a tiny fleck of solder almost abort the Apollo 14 landing?

Last Month's Answer: What dubious unofficial record was set by the crew of Apollo 13?

Apollo 13 holds the unofficial record for the highest altitude from earth reach by man. During a normal flight, the Spacecraft would pass behind the moon at a lunar altitude of 69 Nautical miles. During the free return pass behind the moon Apollo 13 got no closer than 133 nautical miles. Now during a nominal mission the Lunar Orbit Insertion (LOI) burn would place the spacecraft in an elliptical orbit with an apocynthion of about 200 miles, but that point was on the near side pass. On the early missions the orbit would be circularized at 69 miles with a second burn after two orbits (LOI 2). The later missions employed a hybrid burn that put the space craft in an orbit with an apocynthion on the far side of 69 NM and a pericynthion of 50,000' ft on the near

side. This was essentially the same orbit that the LM achieved on earlier missions from which powered decent began. By using the Service Module engine to achieve this orbit, precious LM fuel was saved allowing for a greater payload to be brought down to the surface.



The Crew of Apollo 13: Commander Jim Lovell, CM Pilot Jack Swigert, and LM Pilot Fred Haise

Now about that "Unofficial" bit. Although the crew was 133 miles above the moon, one has to consider the lunar distance as well. The difference in Lunar distance easily was greater than the 64 mile difference in altitude, but no one seems to want to do the math. By my quick reckoning using SkyMap, Apollo 10 may have been higher as the moon was further away from earth, but the point an time of apocynthion seem to be lost or buried in telemetry tapes.

The Guinness book of records recognizes Apollo 13's record, so who am I to argue? After all the crew should get something out of the mission, why not this?

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Call for Observations

Let's take a second trip to the Twins, Gemini, for April. We will have a nice variety of deep sky types for our viewing pleasure. The first is **IC 444**, a bright nebula with a mag 9.5 star involved. Next is the cluster **NGC2304**, which is pretty large. How many stars do you see and what Trumpler classification would you give? This is followed up with **NGC2355**, another cluster, which is about twice as large as the prior cluster. How do these two compare? Continuing with the open cluster theme is **NGC2395** and is even larger and brighter than the prior two. Do you agree? Next is the planetary nebula **PK 205+14.1** also known as Abell 21 or the Medusa Nebula. It is large and has a low surface brightness. Try using a UHC. Finally is the open cluster NGC2420 that is pretty rich, meaning how many stars do you see? Note all of the open clusters

are entries on the Herschel 400 list. Yes, some of these selections will be a challenge and will be worth the effort. Enjoy your observations.

Time for a second trip through Lynx and the star of galaxy season. The selections will include a number of barred spirals and, if the galaxy appears elongated it should be the bar. We start near 27 Lyncis to find the barred spiral **NGC2500**, which has a bright nucleus in the bar. Moving to the southeast is **NGC2537**, the Bear Paw or Bear Claw Galaxy with asymmetrical spiral arms. Now going a little to the north is **NGC2541** another barred spiral. The next galaxy, **NGC2683**, is in the *110 Best NGC* and *Herschel 400* lists. Look for some mottling on the northwest side. Continue the eastward trek to **NGC2770** sometimes referenced as **NGC2770A**. It is a rather small late type spiral and faintest on this list. Finally, the eastern most, is **NGC2776** an almost face-on barred spiral. The bar may not be easily seen yet the bright nucleus should be easier to detect.

Thunderbird Starwatch

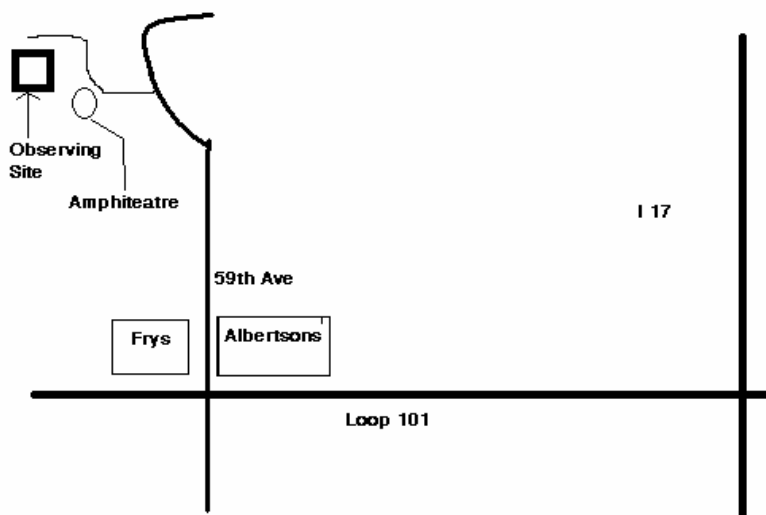
Date: Saturday, May 2nd, 2009

Location: Thunderbird Park, Glendale
(1 1/2 Miles north of Loop 101 on 59th Ave.)

Set up Time: 1830

Sunset: 1913

Hosted by the Saguaro Astronomy Club
and
The Glendale Parks & Recreation Dept.



Directions

Take the Loop 101 to 59th Ave. Head North on 59th Ave. (You'll go past an Albserton's, Fry's & Dillon's Restaurant, if you don't turn around). After crossing Deer Valley Rd, continue up the hill for 0.4 miles to the park entrance on your left. Enter the park and kep right and follow the road past the Amphitheatre to the observing field.

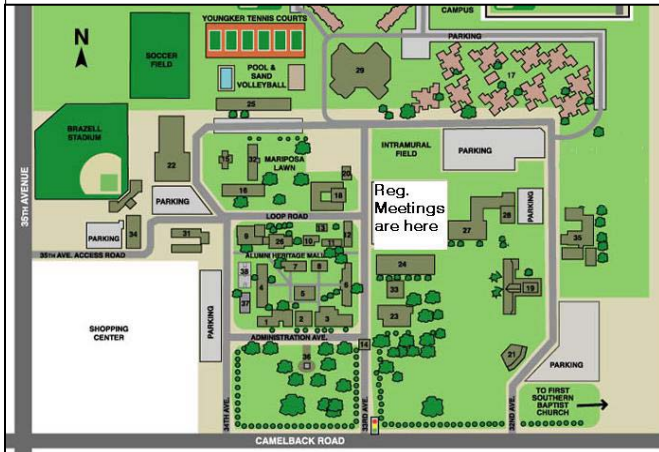
Help celebrate the international Year of Astronomy 2009 by coming out to the annual Thunderbird Starwatch. This has always been a well attended event and with all the publicity fro IYA 2009 I expect we'll have a big turnout, so the more telescopes, the better.

While you're thinking about it, Spread the work to your friends Neighbors & Coworkers. For A flyer that can be posted on your local Bulletin Board Contact Rick Tejera at: saguaroastro@cox.net (hopefully we'll get it on the web site in the next week or so.

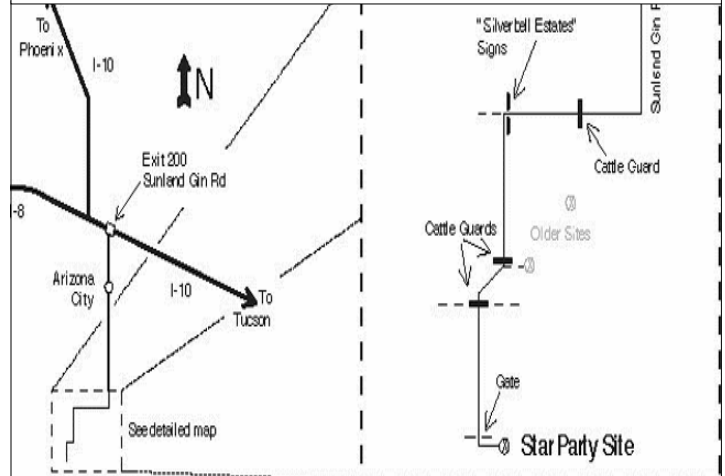
SAC Member Services

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.



All Arizona Messier Marathon



Take I-10 to exit 200 (Sunland Gin Road). From here it is about 29 miles to the site. Turn right (south) after exiting the freeway. After about 15 miles, the pavement ends and about one mile further, the road turns sharply to the west. After another four miles, the main road will turn south just after the "Silverbell Estates" signs. Three miles past the signs, the road will veer off to the west, and five miles further, the road will pass through a gate. Turn left immediately after the gate and continue for another 2/3 of a mile, driving over a fence. The site is to the right.

GPS Coordinates: N32 27.600, W 111 43.800, Elev 1801'

Dark of the Moon Star Parties-2009

Date	Sunset	Moonset	Twilight	Location
January 24th	1758	-	1925	Antennas
February 21st	1825	-	1948	Antennas
March 28th (Messier Marathon)	1835	2001	1957	Antennas
April 25th	1913	2022	2043	Antennas
May 23rd	1930	-	2111	Cherry II
August 22nd	1907	2020	2037	Cherry II
September 19th	1829	-	1953	Cherry II
October 17th	1758	-	1921	Antennas
November 11th	1758	-	1858	Antennas
December 19th	1730	2034	1859	Antennas

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 Only
- \$10.50 Nametag for members, Pinned Clasp
- \$12.50 Nametag for members, Magnetic Clasp
(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 \$34.00/yr
- Astronomy \$60.00 for 2 Years

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 Charlie Whiting
4526 W Purdue Ave
Glendale, AZ 85302

City: _____ St: _____ Zip: _____

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'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.

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

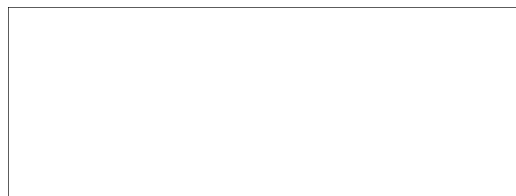
SAGUARO ASTRONOMY CLUB

March 2009

5643 W. Pontiac Dr
Glendale, AZ 85308-9117

Phone: 623-572-0713

Email: newsletter@saguaroastro.org



Videmus Stellae



SAC Schedule of Events 2009

SAC Meetings

January 9th, 2009	July 10th, 2009
February 6th, 2009	August 7th, 2009
March 6th, 2009	September 4th, 2009
April 10th, 2009	October 2nd, 2009
May 8th, 2009	October 30th, 2009
June 5th, 2009	Holiday Party, TBA

Future Planning

March 28th, 2009	All Arizona Messier Marathon
May 2nd, 2009	Thunderbird Starwatch
June 13th-20th, 2009	Grand Canyon Star Party
June 19th-20th, 2009	5 Mile Meadow Star Party

SAC Star Parties

Date	Sunset	Astronomical Twilight Ends	Moonrise	Site
Jan 17th, 2009	1748	1915	0114	S
Feb 14th, 2009	1815	1939	0002	S
Mar 21st, 2009	1844	1939	0417	S
Apr 18th, 2009	1905	2033	0246	S
May 16th, 2009	1925	2104	0111	C
Jun 13th, 2009	1942	2128	2339	C
Jul 18th, 2009	1940	2121	0229	C
Aug 15th, 2009	1916	2047	0117	C
Sep 12th, 2009	1839	2004	0012	C
Oct 10th, 2009	1800	1923	2313	S
Nov 7th, 2009	1729	1855	2216	S
Dec 12th, 2009	1719	1849	0455	S

S= Saddle Mountain; C= Cherry Road; A=Antennas