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Inside This Issue

<i>Water Water Everywhere</i>	1
<i>NASA's Space Place— The Planet in the Machine</i>	2
<i>SAC Holiday Party</i>	3
<i>Last Call For Observa- tion's—Delphinus & Equulus</i>	4
<i>President's Message</i>	6
<i>Calendar of Events</i>	7
<i>Bits & Pieces—minutes from the October General Meeting.</i>	9
<i>Member Services</i>	10-11

Water, Water Everywhere? by Roger Curry

Anyone who grew up in my generation and who was a fan of the sci-fi movies of the 50's and 60's knows that a common theme was the invasion of Earth by aliens who wanted something that was in short supply on their world. Occasionally this was blood or beautiful women, but more often it was our abundant supply of water. It is a fact that when we turn our telescopic eye or robotic probes to the planets and moons of our own solar system, we do find them inhospitable and lacking in that wonderful chemical, dihydrogen monoxide.

The origin of life on this planet is certainly linked to water. Water acts as a solvent in which organic chemicals can be suspended. It provides a medium for the transportation of the simpler molecules needed to build complex self-replicating molecules. It is incorporated into our very tissues. It is one of the only common chemical substances (the other being petroleum) that is liquid at a temperature at which organic compounds are stable and can readily undergo chemical reaction.

Biologists interested in the origin of life feel that life has its greatest chance to gain a foothold on a planet that orbits a star within a zone in which liquid water can exist. The size of this zone will depend on the energy output of the star. For a red dwarf star, the zone may be close in and narrow. For giant stars, the zone may be farther out and wider. The ability of a planet to retain water is linked to the amount of water originally on or transported to the planet, and the atmospheric pressure at the planet's surface. For our own Sun, four major bodies lie within the

water zone: Venus, Earth, the Moon, and Mars. By accidents of size or chemistry, the Earth is the only of the Sun's planets to retain liquid water.

Our ability to see the surface of other worlds is very recent and the solar system has a long history. Conditions now are not the same as conditions in the early history of the solar system. There is evidence for liquid water having existed on Venus and there is certainly evidence of it on Mars. How about the Moon? So far, our robotic probes or our human visits have not found evidence that liquid water flowed on the Moon. On one of its flyby's, the planetary probe Galileo failed to find ice in the polar region of the Moon, though it is not impossible that it could be there in small amounts or that it could have been there in the past. It is unlikely that a body only 1/80th of the mass of the Earth could hold onto water for very long. Unless water is under the pressure of an atmosphere, it is broken down quickly by solar radiation and the free molecules move at a higher average velocity than the escape velocity of the Moon, so they are lost to space. Certain conditions, however, may have favored the existence of water in small amounts for brief periods.

Much of the water on Earth did not originate here. We bathe in, drink, and partly are water which formed among the outer planets and coalesced into comets and asteroids. During the early history of the solar system, small differences in the density of the primordial cloud made some orbits and some small bodies more favored than others. They survived the nu-

(Continued on page 3)



The Planet in the Machine

By Diane K. Fisher and Tony Phillips

The story goes that a butterfly flapping its wings in Brazil can, over time, cause a tornado in Kansas. The “butterfly effect” is a common term to evoke the complexity of interdependent variables affecting weather around the globe. It alludes to the notion that small changes in initial conditions can cause wildly varying outcomes.

Now imagine millions of butterflies flapping their wings. And flies and crickets and birds. Now you understand why weather is so complex.

All kidding aside, insects are not in control. The real “butterfly effect” is driven by, for example, global winds and ocean currents, polar ice (melting *and* freezing), clouds and rain, and blowing desert dust. All these things interact with one another in bewilderingly complicated ways.

And then there’s the human race. If a butterfly can cause a tornado, what can humans cause with their boundlessly reckless disturbances of initial conditions?

Understanding how it all fits together is a relatively new field called Earth system science. Earth system scientists work on building and fine-tuning mathematical models (computer programs) that describe the complex inter-relationships of Earth’s carbon, water, energy, and trace gases as they are exchanged between the terrestrial biosphere and the atmosphere. Ultimately, they hope to understand Earth as an integrated system, and model changes in climate over the next 50-100 years. The better the models, the more accurate and detailed will be the image in the crystal ball.

NASA’s Earth System Science program provides real-world data for these models via a swarm of Earth-observing satellites. The satellites, which go by names like Terra and Aqua, keep an eye on Earth’s land, biosphere, atmosphere, clouds, ice, and oceans. The data they collect are crucial to the modeling efforts.



CloudSat is one of the Earth observing satellites collecting data that will help develop and refine atmospheric circulation models and other types of weather and climate models. CloudSat’s unique radar system reads the vertical structure of clouds, including liquid water and ice content, and how clouds affect the distribution of the Sun’s energy in the atmosphere. See animation of this data simulation at www.nasa.gov/mission_pages/calipso/multimedia/cloud_calip_mm.html.

Some models aim to predict short-term effects—in other words, weather. They may become part of severe weather warning systems and actually save lives. Other models aim to predict long-term effects—or climate. But, long-term predictions are much more difficult and much less likely to be believed by the general population, since only time can actually prove or disprove their validity. After all, small errors become large errors as the model is left to run into the future. However, as the models are further validated with near- and longer-term data, and as different models converge on a common scenario, they become more and more trustworthy to show us the

future while we can still do something about it—we hope.

For a listing and more information on each of NASA’s (and their partners’) Earth data-gathering missions, visit science.hq.nasa.gov/missions/earth.html. Kids can get an easy introduction to Earth system science and play Earthy word games at spaceplace.nasa.gov/en/kids/earth/wordfind.

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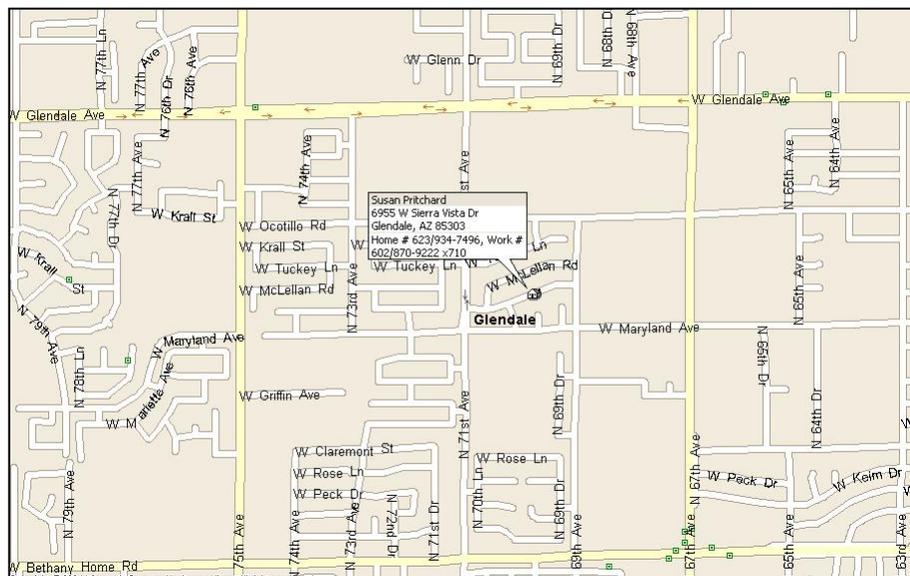
SAC Holiday Party

It's that time of year again. Our annual Holiday party will be held Saturday, Dec 9th,. Our host will again be Susan Pritchard. The festivities begin at at 1800 (6:00p.m.) and as usual it is a potluck, s please bring along something for every one to enjoy.

Susan lives at 6955 W Sierra Vista Dr in Glendale, She's west of 67th Ave & south of Glendale. See the map below for directions.

I look forward to seeing you all there.

Rick



What: SAC Holiday Party

When: Sat, Dec. 9th, 2006

Time: 1800 (6:00p.m.)

Where: Susan Pritchard's House, 6955 W Sierra Vista Dr, Glendale, AZ 85303 (623) 934-7496

(Continued from page 1)

merous collisions that shattered other worldlets and absorbed their pieces. The Moon is believed to have been born of a collision between the proto-Earth and a Mars sized body. Models of the early solar system indicate that a vast number of kilometer-size cometary nuclei formed in the region of the gas giant planets and beyond. The four gas giants are believed to have encountered one of these cometary nuclei each minute for 100 million years before the icy leftover material from the creation of the solar system was swept up or gravitationally ejected to the outer fringe of the solar system, or out of the solar system altogether. Shoemaker-Levy style collisions must have occurred with boring frequency in the early solar system.

In the early solar system, collisions and gravitational interactions must have sent many more comets into the inner solar system than are observed today. It is estimated that there were 1,000 times as many comets which visited the early inner solar system as do so now. If one could have seen beyond the smoke and pall of the atmosphere of the early Earth, he might have seen

the spectacle of dozens of comets at a time. It is estimated that a minimum of three million billion tons of water was transported to the Earth by comet strikes. Other sources for water are found in meteors and in lava brought up by volcanic eruptions. Just as the Earth was bombarded by the heavenly snowballs, so must have been the Moon. During some brief period of bombardment, could not the water vapor from the fallen comets have raised the atmospheric pressure of the Moon enough to let little pools of water settle in the craters?

Perhaps when we send human geologists (or Selenologists) to sift the regolith of the craters near the Moon's poles (where there may be depressions or crevices in permanent shadow), some telltale sediment or crystals will provide the evidence of Lunar lakes of the past.

Ed Note: This article first appeared in the February 1995 issue of "SkyWatch", The newsletter of the Northeast Florida Astronomical Society and is reprinted here with permission of the author. Visit NEFAS at: www.nefas.org

Call For Observations– Delphinus & Equuleus

By A.J. Crayon

We hit the jackpot for observations for the rather small and not very interesting Delphinus and Equuleus. No doubt due to the excellent observing conditions provided by the weather. Note that we now have a new stellar color. In addition to cerulean blue, sea foam green and which star are you calling blue, the orange one; we now have pinky – purple. Want to know more? Then read on!

NGC6891

8" f6, Newtonian, 38X; Charlie Whiting: this little PN is stellar and quite bright. At **60X** it begins to look very slightly extended. At **160X** it looks a little bloated and a 12th mag star appears very close by on its western side. This PN is very small, quite blue in color and very bright. I tried 3 filters but none of them helped. Even high magnification did not improve the view.

8" f/6, Dobsonian, 133X; Rick Tejera: With the O-III filter seen as round with a very slightly brighter middle. Like most planetaries, not a lot of payoff for the effort.

10" F4.5 Dobsonian, 240X; Ken Reeves: Quite small, pretty bright, slightly bluish, star to W. It is very difficult to observe due to wind. Fairly even glow with a slight halo. Filter doesn't do much. May be better in steadier skies and telescope.

12.5" f4.9 Newtonian, 225x; Rick Rotramel - PN - S, pB, slightly oval, much brighter in the middle.

18" f4.5, Dobsonian, 329X; Dan Gruber: This is a small pale blue disk about 10" in diameter. UHC filter shows uniform brightness and no evidence of structure. There is a dim (est. mag 12) central star and a very faint star (est. mag 14) almost touching the nebula on its SE edge. The planetary is "bracketed" by slightly brighter stars (est. mag 10) about 1' away roughly east and west.

20" F5 Dobsonian, 265X; Ken Reeves: Pretty bright, small, round, bluish hue, central star seen, direct vision brings out central star, averted vision brings out the nebula. Star just out of hale to the ENE. Nice.

25" f5, Dobsonian, 353X; Peter Argenziano: Small, round, fairly bright planetary nebula. Appeared bluish in color. The central star is visible most of the time with direct vision. Segments of outer halo visible with O-III filter.

NGC6928

8" f/6 Dobsonian, 80X; Rick Tejera: Found & matched field at 60x & 80X. Did not note anything in the field or area within an eyepiece FOV of the area I drew. Noted in Night Sky Observer's Guide that the smallest aperture used for this object was 12"-14". Based on that, I concluded that this object was not visible in the 8"

under the conditions at the time of observation.

8" f6, Newtonian, 160X; Charlie Whiting: this galaxy is a dim smudge and is oblong, 2' x 1'. Aligned roughly E-W. 6928 is just west of a 12th and south of a 13th mag star.

18" f4.5, Dobsonian, 329X; Dan Gruber: These two galaxies are perpendicular to each other. The northernmost of the two, NGC 6928, is elongated E – W with a halo approximately 2' X 0.5'. There is a diffuse, slightly brighter core. There is a very faint star (est. mag 14) on the N edge. NGC 6930 is about 5' SSE of NGC 6928.

20" F5 Dobsonian, 265X; Ken Reeves: -28 is the brighter. Little faint, pretty small, elongated 4:1 E/W, slightly brighter middle, star to the N. There is possible mottling or dark spot on the S. The other galaxy (-30) is to the SE. Pretty faint, pretty small, elongated N/S 5:1, no other detail seen. Occasionally suspect a hazy spot to the SSE of brighter galaxy (Confirmed as nothing there, not 6927 which was not seen)

25" f5, Dobsonian, 244X; Peter Argenziano: NGC6928 appeared larger and brighter than NGC6930. NGC6928 looks like an edge-on galaxy with a hint of a dust lane. Bonus: a third galaxy contained in the field of view, NGC6927, the smallest and faintest of this trio.

NGC6930

8" f6, Newtonian, 320X; Charlie Whiting: this was a tricky galaxy to see in my 8" telescope. I almost gave up on it. But I didn't. It was a tiny and very dim splash of 'nebulousity'. Very thin, maybe 30" x 5". Aligned roughly N-S. It was bordered at both ends by dim stars, the brighter of which was 12.6 mag. Skymap doesn't plot the 2nd star but I can see it in images. It may not be a star. The images show that it has nebulousity around it.

18" f4.5, Dobsonian, 329X; Dan Gruber: NGC 6930 is about 5' SSE of NGC 6928. It is extremely faint, oriented N – S, and appears to be roughly 1' X 0.5'.

25" f5, Dobsonian, 244X; Peter Argenziano: NGC6930 appeared round, very faint with no discernible structure.

NGC6934

8" f6, Newtonian, 60X; Charlie Whiting: (1st observation). This GC is easily. It looks like a spur on the back of a boot, five 9th, 10th and 11th mag stars make up the boot outline west and north of the GC. There are about four 12th mag stars that participate. This GC is supposed to be 6' in diameter, but at **120X** I am only seeing an object not much more than 1'. A 9th mag star (the heel of the boot) is due west and is within the 6' boundary. Due east of the center of the GC and also

(Continued on page 5)

(Continued from page 4)

within the 6' boundary is a 12.7 mag star, about as dim as I can see from my Glendale backyard. Here is a 2nd observation from a dark site. This is an easy object to find, even at only **38X**. It is fairly large and fairly bright. It is sited in an area of about ten 7th, 8th, and 9th mag field stars. Two of the 9th mag stars point directly to 6934. One of these is superimposed on the west side of the GC, although it was not apparent at this low power. At **160X** this object gave me the impression that it was a spiral galaxy. It seemed to have swirls radiating around its extent. It was gradually brighter to the middle. At **240X** I spied a 13th mag star superimposed on the eastern edge of the GC.

10" F4.5 Dobsonian, 100X; Ken Reeves: Not too big, pretty bright with a much brighter center, round, star immediately to W, no stars resolved, barely granular. At **140X**, definitely granular, middle possibly elongated N/S. Not real exciting, easy to find, fairly run of the mill.

16" f4.4 Newtonian, Rick Rotramel: GC - pL, fB, Rich, a little oval shaped, granular, little brighter in the middle. Nice.

18" f4.5, Dobsonian, 209X; Dan Gruber: At this magnification the cluster looks like the proverbial "diamond dust". A fairly bright 2' core fades into a 5 – 6' halo which is slightly elongated NW – SE. More than a dozen stars are resolved in the halo. At **329X**, the core begins to resolve and about a dozen faint stars are observed.

20" F5 Dobsonian, 265X; Ken Reeves: Pretty bright, somewhat small, round, evenly brightens up to the middle. 2 levels of stars resolved with an extremely grainy background. Estimate 50 stars. There is a bright star to the W, several strings in the halo.

25" f5, Dobsonian, 353X; Peter Argenziano: Round, fairly rich, resolved to its bright core. There is a ninth magnitude orange GSC star lies just to the west.

NGC7006

8" f6, Newtonian, 60X; Charlie Whiting: Compared to 6934, 7006 was harder to find, smaller and dimmer. It was detectable at **60X** but not much of a sight. At **160X** it was round and pretty small and gradually brighter in the middle. As I stared at 7006 I thought I could see another extended object to the south and immediately adjoining the GC. I checked Skymap but nothing was there. I did a Google search. Most of the images showed only one object, but they all looked burned out in the middle. Then I found an image from Mount Tuffley Observatory UK 09/09/99 JRF. This image was not burned out. It showed that 7006 had 2 lobes roughly north and south. The GC is in the center of a box consisting of four 11th mag stars.

10" F4.5 Dobsonian, 70X and 140X; Ken Reeves: At **70X** somewhat bright, fairly small, round, and little brighter in

middle. At **140X**, getting pretty dim, no granularity, somewhat brighter middle, round halo. This is one of the poorer globular clusters (although one of the more distant).

16" f4.4 Newtonian, 200x; Rick Rotramel: GC - S, fF, vRich, round, barely resolved, much brighter in the middle.

18" f4.5, Dobsonian, 209X; Dan Gruber: A dim core about 2' in diameter fades into a slightly larger symmetrical halo. At **329X** a few stars are resolved in the core.

20" F5 Dobsonian, 265X; Ken Reeves: Little faint, somewhat small, no stars resolved, slight granularity, round. Slowly then more suddenly brightens up to the middle. Very faint star just on the N edge.

25" f5, Dobsonian, 244X; Peter Argenziano: Small, faint, diffuse globular cluster. It is fairly well resolved.

Now on to Equuleus where our first object is something rather new.

Levy 70

It is also called the Equuleus S as it is an S shaped asterism located at RA 21h 09m Dec +06° 18' or almost 1° east northeast from 6th mag 4 Equulei. For more information about David Levy's list may be found at www.jarnac.org/levylist.htm

8" f6, Newtonian, 80x; Rick Tejera: Noted the "S" shape easily, although could not see as many stars as are plotted in SkyMap.

8" f6, Newtonian, 67X; Charlie Whiting: The coordinates for this object are centered on a 9.3 mag star. Assuming it represents the midpoint of the letter, "S", there are about 10 stars, 10th through 12th mag, forming the upper 'hook' of the "S". The uppermost part resembles a fishhook. There are about 10 stars, also 10th through 12th mag, forming the lower 'hook' of the "S". The bottom of the "S" appears flat, as though the letter were sitting on a line. I see the PA for this object as 90° using the upper 'hook' as the primary portion and the lower 'hook' as the secondary portion.

12.5" f4.9 Newtonian, 100x; Rick Rotramel - Asterism - L, pB, ~ 25 stars, shaped like a vertically stretched out "S", and "drawn in the sky" a little sloppy.

18" f4.5, Dobsonian, 74X; Dan Gruber: This asterism, which is more than a degree in total extent, is very roughly S – shaped oriented approximately ENE - WSW. Proceeding from one end of the asterism to the other the position angle naturally changes, but the overall PA from the W end to the E end is approximately 60 degrees (240 degrees in the other direction). The asterism consists of 20 – 22 mag 10 -12 stars. At **135X**,

(Continued on page 8)

President's Message

By Rick Tejera



Well, I made it through my first year as president of the Saguaro Astronomy Club. Both the Club and I are doing fine!

It certainly was a good year with a more ups than downs. I know I'm a month early, but I'd like to devote this column to thank those who helped make this year successful.

The 2006 All Arizona Messier Marathon was a great success, thanks to the efforts of AJ Crayon & Jack Jones. Although Clouds prevented any 110's, the weather made the event more challenging than usual and provided an interesting diversion from the norm. We were honored to have Don Machholz observe with us as well. Without Don's influence, the Messier Marathon would not be what it is today. I hope he finds the time to visit us again soon.

Our annual trek up north to 5 Mile Meadow was rudely interrupted by fire season. Al though disappointing, we have to remember the big picture, public safety. Not to be dissuaded, Steve Coe, the events organizer, rescheduled for September and then made an end run around some dewy conditions by heading to our newest dark Sky Observing Site: Hovatter Road, or the Antenna site, as Steve likes to call it. Al though unable to attend myself, the reports from the event were positive. Jack, "King of Porta Potties", Jones even found a local outfit that would deliver said convenience to the site.

Paul Lind got together a fine slate of speakers for our meetings. I'm looking forward to next years line up (Our own Steve Coe will lead off in January). Paul's Job as VP is the most difficult of the board members given this responsibility and I thank him profusely for his efforts.

Thanks to Paul Dickson, we know we are in a sound financial status. Looks like we'll even have some money to budget for our 30th anniversary celebration next year.

Those of you who don't get a chance to attend our regular meeting can thank Susan Pritchard for her excellent job of recording the minutes of the meetings and also for hosting our holiday party last year and this.

Our regular summer observing site at Cherry Rd became unavailable due to grading techniques designed to keep vehicles out of the meadow. Luckily, we were able locate a suitable spot down the road a bit that will serve us well. Steve dubbed this Cherry II. So no sweltering at Flat Iron during the summer!

Both, spring & fall editions of the Thunderbird Starwatch were big successes as well. Both were well attended and thanks to the city of Glendale for providing port-a-johns. Jack Jones also coordinated several public & school star parties during the year. If you haven't done this kind of outreach, I encourage you to give it a whirl. You'll have fun and meet some very nice people.

As if you didn't have enough choices of what to observe in the SAC Database, Steve Coe was busy updating the SAC Double Star database, and created the SAC Red Star Database & the 110 Best Asterisms List.

I don't want to hear anyone say I don't know what to observe!

I encourage our newer members to try working on one of our observing lists, it's fun way to organize your observing and there's something satisfying about achieving a goal.

While I'm at it, AJ gets a second nod for his work collecting and organizing members observations for his Last Call for Observations column in this newsletter. Anyone that fills 3 pages gets my undue thanks!

On a personal note, I didn't get a whole lot of observing done in the first half of the year due to life's little interruptions, but made up for it with a vengeance beginning in August. I still haven't Scanned & logged my observations from the All Arizona Star Party!. Hopefully your observing year was more consistent. I look forward to getting out more next year. My biggest goal is to take a decent chunk out of the H400 galaxies in Virgo, Coma Berenices, Leo & Ursa major this spring. I'm a little more than halfway there (I'll exactly once I finish logging my recent observations), which means about 2/3's of what's left are spring galaxies. As usual, I turn an observing program into a seasonal affair!

In closing, I'd like to thank all of you for your confidence in me to lead the club this past year and next. I'm proud to be associated with the Saguaro Astronomy Club and the people that make it the great organization it is.

Last, but certainly not least, Thanks to my family, Susan & Lindsay, who put up with me disappearing into the computer room for hours on end and leaving them to fend for themselves when I go observing. I love you both.

Happy Holidays
Rick

December 2006

SUN	MON	TUE	WED	THU	FRI	SAT
					1	2
3	4 ○	5	6	7	8	9 SAC Holiday Party: 1800
10	11	12 ☾	13	14	15	16 SAC Star Party, Flat Iron
17	18	19	20 ●	21	22	23
24	25	26	27 ☽	28	29	30
31						

Schedule of Events for December 2006

Dec. 4th	Moon is full at 1725 mst.
Dec. 9th	SAC Holiday Party At Susan Pritchard's house at 1800. See Page 3 for more information.
Dec. 12th	Moon at last quarter at 0732 mst
Dec. 16th	SAC Star Party at Flat Iron, Sunset 1725, End Ast. Twilight 1854 Moonrise 0449.
Dec. 20th	Moon is new at 0701 mst.
Dec. 21st	Winter Solstice at 1722 mst
Dec. 27th	Moon at first Quarter at 0748 mst

Future Planning

Jan 5th, 2007	First meeting of 2007, at Grand Canyon University.
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(Continued from page 5)

about 30 stars of mag 10 – 13+ are visible. There are two mag 10 – 11 stars about 3' apart near the W end that are perpendicular to the main axis of the asterism. The bend in the overall S shape near the W end is rather "thick" in that there are several stars outside of but near the main axis of the asterism. There are several possible doubles in the asterism. One is a very faint (est. mag 13 – 14) pair in the curve near the W end. These stars are about 30" apart with PA 200 degrees. Another possible pair is in the curve near the E end. These mag 12 – 13 stars have separation of about 60" at PA 225 degrees.

NGC7015

8" f6, Newtonian, 160X; Charlie Whiting: this galaxy is a tiny ghost of an object. Seems slightly oblong, aligned N-S. Estimate extent at 2'. There's a 12th mag star to the west and a 13th mag star to the south.

18" f4.5, Dobsonian, 209X; Dan Gruber: This galaxy has a very faint core <1' in diameter fading into an even dimmer round halo about 2' in diameter. No additional detail was visible at higher magnification.

20" F5 Dobsonian, 160X; Ken Reeves: Somewhat faint, pretty small, round, averted vision brings out halo quite a bit. Brightening to a possibly stellar nucleus. Faint star involved on SSE. There are stars to WSW, SSE, and E. Possible mottling.

25" f5, Dobsonian, 353X; Peter Argenziano: Small, faint smudge of a barred spiral. No discernible structure noted.

NGC7045

An interesting discovery by John Herschel in 1827 and seen as extremely faint and later identified as a double star! So get ready for this one because it is about 14th mag. To help with locating this gem it is at RA 21h 14m 50.2s Dec +04° 30' 25" or about 6' SSW from 9th mag SAO126648 but do not confuse with a 12th mag star a little farther away.

8" f6, Newtonian, 320X; Charlie Whiting: this object appears to be a dim star, or 2 stars with very little separation, about 12th or 13th mag. A 13th to 14th mag variable star, RT Equulei, is about 2' WSW.

18" f4.5, Dobsonian, 329X; Dan Gruber: This is a close double with separation <5". I did not observe the PA. The primary is mag 10 – 11 and appears gold (somewhere between yellow and orange). The secondary appears at least 3 magnitudes dimmer (est. mag 13 – 14). In multiple observations over a 30-minute period the color of the secondary sometimes appeared blue and sometimes pinky – purple. Since the color purple is a mixture of red and blue, I think the star is purple but it appears redder or bluer depending on specific viewing conditions.

25" f5, Dobsonian, 353X; Peter Argenziano: Bright orange primary with a very small, very faint, very tight bluish companion.

Call for Observations

We haven't done Aquarius, so let's make it our choice for December. Starting in the southwest part of the constellation and a little more than a degree west of southwest is the **Helix** and, although it is large it has a low surface brightness. The globular cluster **M2** is a little more than a degree southwest of 6th mag SAO145533. This magnificent stellar island should be visible in your finder. While there can you see the diffuse nebula Cederblad 193, just include a yes or no about its visibility? The magnitude 10.8 galaxy **NGC7606** is found about one degree northeast of ψ_1 , that's the western most ψ_1 . You didn't think we would get away from galaxies, did you? Here's another, **NGC7184** that is about a degree northeast of 6th magnitude BW Capricorni. This next to last one, **NGC7492** a globular cluster is a toughie. On a reasonable night it was very difficult in my 14.5" telescope and I had to use Uranometria to verify its position. You have been warned. It is about 40' east southeast of 8th magnitude SAO165488. The last one is a sentimental favorite of several observers, including Gerry Rattley. It is the double star **107 Aquarii** located about 30' southeast from 5th magnitude 106 Aquarii. This double of 5.7 and 6.7 magnitudes has nice contrasting colors. Here's the fun part, what colors do you see. And be honest!

Since we are using digital setting circles of some sort I'll no longer give directions from a bright star. If we are setup correctly there shouldn't be any problem pushing-to or going-to any of the objects. Having said that let's get to the constellation and its objects. January will find us searching around the large, but commonly overlooked constellation of Pisces. Version 7.5 of the SAC database lists about 400 entries, of which we will avoid the ones fainter than mag 12.5. This gives us a selection of something like 35 objects, mostly galaxies, from which to choose. We will start with two 11.6 mag ellipticals, namely **NGC7562** and **NGC57**. What kinds of detail do you see in these galaxies? Next is the fainter barred **NGC182**. It is the brightest in a group of galaxies brighter than 14th mag. How many do you see in the group? Departing from galaxies is the asterism **NGC305** to which Dr. Harold Corwin of the NGC/IC Projects lists six stars, but no cluster. What is its size and stellar magnitudes? Going back to galaxies take a look at

(Continued on page 9)

Bits & Pisces– Minutes of the October 6, 2006 General Meeting

By Susan V. Pritchard

The October 6th, 2006 meeting opened at 7:30 by President Rick Tejera, who welcomed all visitors and members. He invited the visitors to introduce themselves and sign the guest book and receive a copy of the SAC newsletter. Paul Dickson gave the Treasurer's Report—the club has a balance of \$5,364. Paul again reminded members to renew their memberships for 2007.

Announcements: The upcoming 30th Anniversary Celebration of SAC for 2007 will be a dinner; Jennifer Polakis and Gene Lucas volunteered as part of the Planning Committee. Peter Argenziano announced that he now has the Observers Handbooks 2007 now available and can be ordered for next year. He took a preliminary head count of those who wanted to order one. Steve Coe thanked Gene Lucas for help with the List of 110 Asterisms. He also said that there are some handouts with the Galaxies list, and the Double Stars on the Website. The Deep Sky list will be posted and has 10,000 objects in the database. He also said that his book would be available at the Sentinel Stargaze party.

Nominations: Rick Tejera then opened the nominations for officers for next year. The following were nominated: President: Rick Tejera; Vice President: Paul Lind; Secretary: Jennifer Polakis; Treasurer: Paul Dickson; Properties: open. Rick then closed the October nominations.

Nominations will continue in November, followed by elections if needed.

Upcoming Events: October 14th will be the regular star party at Flat Iron. Map is in the newsletter. Steve Dodder said that the next potluck at Stone Haven Observatory is on Saturday, October 14, 2006. It will be a potluck and encouraged all to bring their telescopes as well. Joe Orman will be there again.

Oct. 20-21 will be the All Arizona Star Party, hosted by EVAC.

The Thunderbird star party will be on Saturday, Oct. 28; all members are encouraged to bring their scopes, the expected number of visitors is usually over 500.

The next SAC general meeting will be on November 3 here at Grand Canyon University.

November 11 will be the Star Part at Flat Iron.

November 17-18 is the Sentinel Schwaar Stargaze.

Dec. 9th Holiday Party at Susan Pritchard's house at for 6955 W. Sierra Vista Drive, Glendale, 85303, (623)934-7496, svpritchard@msn.com. A Map is on page 10 of this issue.

Show and Tell: Gene Lucas presented a Sherman Tank yellow wide-angle eyepiece, made with the Rare Earth



Jon Christensen, Our October Speaker

Thorium. Because this is radioactive, it registers on a Geiger counter, but was not harmful to the eye. Jack Jones then brought in several inexpensive items that can be used with star-gazing. These included the chemical glow sticks, and fog wipes, and red light key chains. Steve Coe warned everyone about the Shake and Fake battery powered lights. Tom Polakis then showed his slides from the Okie-Tex Star Party. Steve Dodder reminded everyone about the potluck on Oct. 14 at the Stone Haven Observatory in Maricopa. Check the website for directions.

After the break, Paul Lind introduced our speaker, Jon Christensen, who talked about astro-imaging. The meeting adjourned at 10:00 pm and members went to the JB.'s restaurant at Northern and 35th Avenue for fellowship and food.

Respectfully submitted,
Susan V. Pritchard
Secretary, Saguaro Astronomy Club

(Continued from page 8)

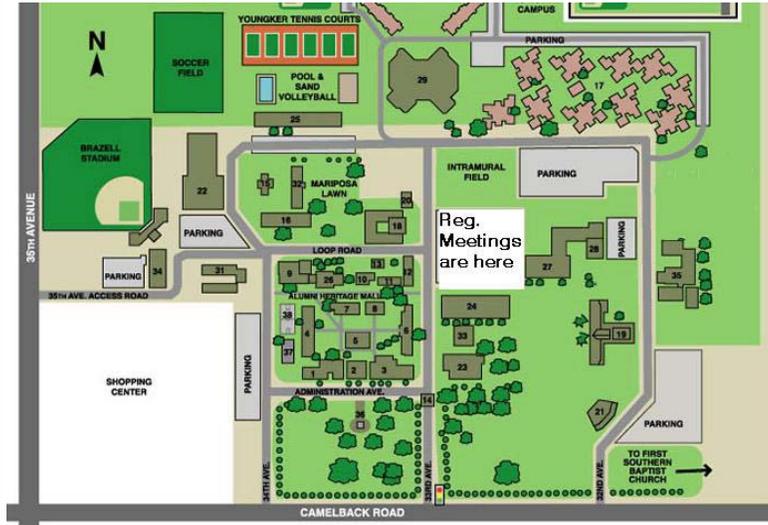
NGC488. It has a ring and eight faint stars. Where are the stars? Are any spiral patterns seen? Next is the M82 type **NGC520**, a peculiar galaxy. What's so peculiar about its visual characteristics? Finally there's **M74**. Need I say more? We often see it low on the western

horizon during a Messier Marathon but now we have the chance to view it higher, much higher, in the sky. As with everything in this list, try as much power as the evening will permit to ferret out as much detail as possible.

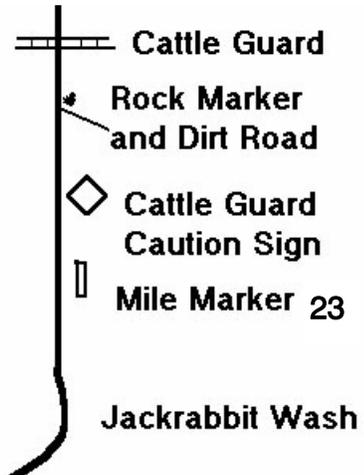
SAC Meeting and Observing Sites

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



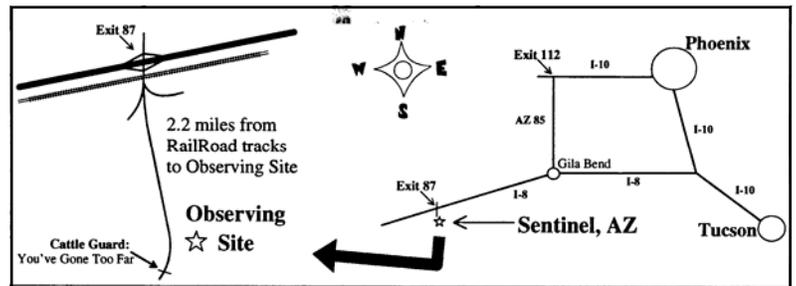
Flatiron Star Parties



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 2 miles 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).

Sentinel

Get to Gila Bend. From there head West on I-8 to exit 87, Sentinel. Turn left under the overpass and continue across the railroad tracks. Follow the dirt road for 2.2 miles to the site which is on the left. If you get to a cattle guard, you've gone to far.



Monthly Trivia Question

What aspect of Yuri Gagarin's spaceflight was kept secret until after the fall of the Soviet Union for fear that the USA would claim that his achievement didn't count as the first man in space?

Answer next month

Answer to last month's question: Around what object was the first exoplanet discovered?

The first exoplanet was discovered orbiting Pulsar PSR B1257+12 in 1992. It was detected by timing the variation in the pulses of it's parent Pulsar.

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 Paul Dickson
7714 N 36th Ave
Phoenix, AZ 85051-6401

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

November 2006

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Videmus Stellae



SAC Schedule of Events 2006

SAC Meetings

January 5th, 2007	July 27th, 2007
February 2nd, 2007	August 24th, 2007
March 2nd, 2007	September 28th, 2007
April 6th, 2007	October 26th, 2007
May 4th, 2007	November 16th, 2007
June 1st, 2007	December 2007
June 29th, 200	Holiday Party-TBA

SAC Star Parties

Date	Sunset	Astronomical Twilight Ends	Moonrise	Site
Dec 16th, 2006	1725	1854	0449	F
Jan 13th, 2007	1744	1912	0336	F
Feb 10th, 2007	1811	1935	0223	F
Mar 10th, 2007	1835	1958	0112	F
Apr 14nd, 2007	1901	2029	0447	F
May 12th, 2007	1927	2059	0311	C
Jun 9th, 2007	1940	2125	0140	C
July 7th, 2007	1944	2128	0013	C
Aug 11th, 2007	1920	2054	0522	C
Sep 8th, 2007	1845	2011	0415	C
Oct 6th, 2007	1809	1932	0314	F
Nov 3rdh, 2007	1737	1902	0207	F
Dec 1st, 2007	1723	1851	0057	F

Special Events

March 16-17th, 2007	All Arizona Messier Marathon
June 15-16th, 2007	5 Mile Meadow Star Party
November 9-10th, 2007	Sentinel Schwaar Stargaze

F= Flatiron; C= Cherry Road II