Saguaro Astronomy Club

SACnews

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Inside This Issue

TOP TWENTY THINGS AN ASTRONOMER SHOULD SEE

By Helen Mahoney

As a lifelong amateur astronomer, I have had the opportunity to see so many exciting and wonderful things related to astronomy.

I started many years ago to make a list of the things I wanted to see, and I have managed to experience a good many of those things. In addition, I have had the fortune to experience a lot of great astronomical spectacles that I wasn't planning or expecting to see.

I decided to compile them and describe them to give my fellow amateur astronomers an idea of what I feel are the astronomical top twenty things to see. It's kind of a "bucket list" for amateur astronomers.

There are amazing things an astronomer can see every year—every day even. The key is being in the right place at the right time. Sometimes, it also means having the right equipment, such as a telescope. Most of the things on my list do not require expensive or sophisticated equipment; however, some of the better ones do usually require planning and travel.

Living in Long Beach, California most of my life, there is a limit to what I can see from home. The Los Angeles and Orange County areas are severely light polluted. Those of you who live in darker sky areas will not have to travel far to see many of the things on my list. A few of them can even be seen from light polluted areas.

So, here they are—arranged from the easiest ones to see to the more difficult, rare, and spectacular—are my Top Twenty Things an Amateur Astronomer Should See:

#20: The International Space Station
#19: Saturn's rings
#18: Jupiter's moons, including moon shadows
#17: The green flash
#16: The Andromeda Galaxy naked eye
#15: A total lunar eclipse
#14: Messier objects with binoculars or a small telescope
#13: Any object through a large telescope
#12: Sun with a hydrogen alpha telescope
#11: Venus in daylight
#10: The Milky Way from a really dark sky
#9: A naked eye comet
#8: A really great meteor shower
#7: The Aurora
#6: The Southern sky
#5: The midnight sun
#4: The moon occulting a planet
#3: A transit of Mercury or Venus
#2: A supernova
#1: A total solar eclipse

Next month, I will start with #20, and work through the list, giving you an idea of why you should consider putting each of these on your personal "must-see" list. I will also give you some advice from my personal experience on how you can have these experiences.

This article was first run in the January 2010 issue of "The Sirius Astronomer", the official Newsletter of the Orange County Astronomers (www.ocastronomers.org) and is use here with permission of the both OCA and the Author.

NASA Space Place

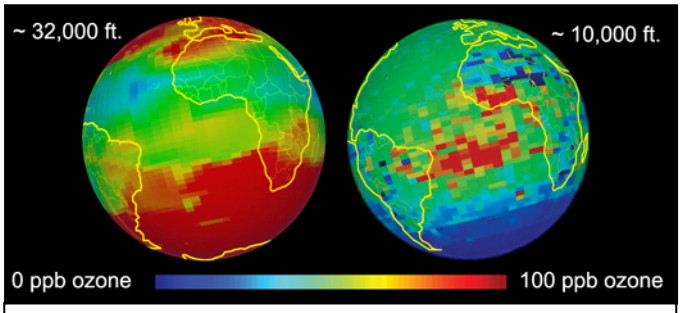
Building a Case Against Ozone

by Patrick Barry

When it comes to notorious greenhouse gases, carbon dioxide is like Al Capone—always in the headlines. Meanwhile, ozone is more like Carlo Gambino—not as famous or as powerful, but still a big player.

After tracking this lesser-known climate culprit for years, NASA's Tropospheric Emission Spectrometer (TES) has found that ozone is indeed a shifty character. Data from TES show that the amount of ozone—and thus its contribution to the greenhouse effect—varies greatly from place to place and over time.

"Ozone tends to be localized near cities where ozone precursors, such as car exhaust and power plant exhaust, are emitted," says Kevin Bowman, a senior member of the TES technical staff at the Jet Propulsion Laboratory. But the ozone doesn't necessarily stay in one place. Winds can stretch the ozone into long plumes. "Looking out over the ocean we can see ozone being transported long distances over open water."



These images are TES ozone plots viewed with Google Earth. Colors map to tropospheric ozone concentrations. The image on the left shows ozone concentrations at an altitude of approximately 32,000 feet, while the one on the right shows ozone at approximately 10,000 feet. The measurements are monthly averages over each grid segment for December 2004.

Unlike CO_2, ozone is highly reactive. It survives in the atmosphere for only a few hours or a few days before it degrades and effectively disappears. So ozone doesn't have time to spread out evenly in the atmosphere the way that CO_2 does. The amount of ozone in one place depends on where ozone-creating chemicals, such as the nitrogen oxides in car exhaust. are being released and which way the wind blows.

This short lifespan also means that ozone could be easier than CO_2 to knock off.

"If you reduce emissions of things that generate ozone, then you can have a quicker climate effect than you would with CO_2," Bowman says. "From a policy standpoint, there's been a lot of conversation lately about regulating short-lived species like ozone."

To be clear, Bowman isn't talking about the famous "ozone layer." Ozone in this high-altitude layer shields us from harmful ultraviolet light, so protecting that layer is crucial. Bowman is talking about ozone closer to the ground, so-called tropospheric ozone. This "other" ozone at lower altitudes poses health risks for people and acts as a potent greenhouse gas.

TES is helping scientists track the creation and movement of low-altitude ozone over the whole planet each day. "We can see it clearly in our data," Bowman says. Countries will need this kind of data if they decide to go after the heat-trapping gas.

Ozone has been caught red-handed, and TES is giving authorities the hard evidence they need to prosecute the case.

Learn more about TES and its atmospheric science mission at tes.jpl.nasa.gov. The Space Place has a fun "Gummy Greenhouse Gases" activity for kids that will introduce them to the idea of atoms and molecules. Check it out at spaceplace.nasa.gov/en/kids/tes/gumdrops.

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

Financially Speaking

Charlie Whiting

2009 was a turn-around year. For the preceding two years our costs of operation were higher than our income. Thanks to tee-shirt sales, the 50-50 raffle, contributions and spending less, our 2009 income exceeded our costs in spite of receiving less money in dues.

Item	2008	2009
Income from dues	$2,313.50	$2,114.50
Profit from T-shirt sales	0	397.66
50-50 raffle	0	263
Contributions	119.58	167.71
All other sources	155.52	84.45
Totals	$2,588.60	$3,027.32
Less Expenses	$3,317.81	$2,259.08
Net (Loss) Gain	($729.21)	$768.24

You can see that our Expenses were a lot less in 2009 than 2008. Here's where the money went for the two years:

Item	2008	2009
IDA dues	$100.00	$0.00
Awards expense	$308.37	$333.71
Charitable donation	$200.00	$0.00
Hosted Events		
5MM	$202.54	$0.00
GCSP	$200.00	$0.00
AAMM	$75.26	$162.77
Insurance	$500.00	$500.00
Speaker Honorarium	$1,150.00	$650.00
Room Rent	$330.00	$330.00
All other expenses	$251.64	$282.60
Totals	**$3,317.81**	**$2,259.08**

Our IDA dues were paid on the club's behalf by a member who wished to remain anonymous. If another member is interested in doing this for 2010, please contact the Treasurer, Dave Fredericksen. For 2010 we could easily spend more for speaker honorariums or porta-potties. There were 91 registered members at the end of 2008. At the end of 2009 there were 83 members. Respectfully submitted by Charlie Whiting.

Such-A-Deal

"For sale-Vintage 1956 Coast Treckerscope 10" F/7 on hand-made German equatorial mount. Original fiberglass tube, mount, slow-motion control cable, finder scope and pedestal. New, low profile JMI focuser, tube rotation system and wheeled dolly for easy transport. Drive needs work. Tube and rotation system 80% complete refurbish. Worth several thousand dollars. Price: $1000. Must sell. Lost another job."

Call For Observations–Sculptor

By A.J. Crayon

The constellation Sculptor got its name from Nicolas Louis de Lacaille who, originally, named it Apparatus Sculptoris for the sculptor's studio. Naturally this latter name didn't stick around. We all know this as a rather small and southerly constellation, which makes it suitable for observations for only a short time at night. SAC observers, again, took advantage of this and made another excellent observing report. Certainly you will notice there were only two sizes of telescopes used for these observations; perhaps a sign of popular sizes?

The first of the galaxies was **NGC 24**, an 11.6 mag nearly edge-on normal spiral. Seems we didn't notice the brighter middle.
8" f6, Newtonian, 60X; Charlie Whiting: detected this object with direct vision. At **150X** this galaxy is very elongated. It is likely called a spindle. In my scope it looked to be about 3' or 4' long by 1' wide; maybe slightly more. There's a 14th mag star just outside its northern point. The galaxy is aligned a little north of northeast. It appeared almost uniform in brightness overall. It diminished very gradually at the sides and points. No central condensation.
8" f6, Dobsonian, 61X; Rick Tejera: Seen as bright and elongated about 3-1 in PA E-W Rather uniform in brightness throughout. Averted vision needed to hold. Possible hint of a core during moments of steady seeing.
14.5" f4.8, Dobsonian, 66X and 138X; Paul Lind: Somewhat faint, small, very elongated spindle, not bright in middle. Just off a triangle of stars.

The second galaxy was **NGC 134**, another nearly edge-on barred spiral. There are some 10th mag stars in the field of view. Great job spotting the bar!
8" f6, Newtonian, 60X; Charlie Whiting: galaxy was detected without much difficulty. At **150X** It appeared elongated. Its visible length was about 3' and its width was about 1', maybe slightly more. It was aligned to the northeast. It had a brighter area in the middle. Gradually diminishing towards the points. It appeared a little thicker on its southeast side. There's a group of stars off its southwest point that form a bright square with a dimmer star in the center.
8" f6, Dobsonian, 61X; Rick Tejera: Seen as large & bright, slightly elongated about 2-1 NE-SW. The bar is evident running the length of the galaxy. The halo extends further to the South. There is an interesting ""Crux"" like asterism to the SW.
14.5" f4.8, Dobsonian, 66X and 138X; Paul Lind: a little bright, considerable elong., little brighter in middle, larger and brighter than NGC24, nearby is nice square of stars with middle, or central star.

NGC 148, next on the list, is rather faint has a spindle shape with a brighter middle. Its faint magnitude made detecting some detail somewhat difficult.
8" f6, Newtonian, 60X; Charlie Whiting: this object was visible as a star-like. At **150X** the galaxy was seen as very small and circular in shape. Its visible diameter was only about 10" to 20". The central area was much brighter than the halo. The brightness drops off quickly to the outside. To the northeast there's a 9.8 mag star. It marks the peak of the roof of a simple house figure which includes the galaxy at the base.
8" f6, Dobsonian, 61X; Rick Tejera: Seen with averted vision only. Saw it as barely visible and round. Did not see the Spindle shape. The seeing at the time was not that great, so this will go on the re-observe under better conditions list. It's be nice if the ""Better conditions"" meant somewhere in the southern hemisphere.
14.5" f4.8, Dobsonian, 66X and 138X; Paul Lind: Very Small, very Faint, elongated, hard to locate.

The large spiral **NGC 300** brought some interesting observing notes. Check them out and see what you think.
8" f6, Newtonian, 60X; Charlie Whiting: this is a very large galaxy and its low surface brightness makes it almost impossible to see. It is therefore a very very faint object. Only after staring at it for a long time did I just barely detect some of its ghostly nebulosity in the area near the 9.6 mag star superimposed almost at the center of the galaxy.
8" f6, Dobsonian, 61X; Rick Tejera: Seen as large & bright but with low surface brightness. Very slightly elongated. Could see three foreground stars superimposed on the galaxy. Slightly brighter to the north. There was some irregular fading to the east seen with averted vision that possibly could have been one of the spiral arms The western side was brighter and I drew what looked like a curved arc, although I think that was the pencil working on it's own.
14.5" f4.8, Dobsonian, 66X and 138X; Paul Lind: Quite low. Very Large, Considerably Faint. Could not see detail.

The next galaxy, **NGC7513** is listed with peculiarities, which no one was able to see or report on. Detail was also difficult to come by.
8" f6, Newtonian, 60X; Charlie Whiting: just barely detected the object with averted vision. At **150X** in brief moments I could detect the galaxy with direct vision. With averted vision I could see it better but only for a couple of seconds at a time. The visible size to me was about 1' x 0.5'. Its alignment is east south east. The central area is

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non-stellar, extended, and brighter than the halo. Some 13th and 14th mag stars could be seen to the north north east. An 8th mag star and its 10th mag companion could be seen east of due south. While I was "in the neighborhood" I meandered about 18' to the southwest to see NGC 7507. This galaxy was easily visible with direct vision, but averted vision showed it off better. Its visible diameter in my scope was about 1'. It appeared circular and splashy. Much brighter center, non-stellar. Textured halo. Worth the stopover!

8" f6, Dobsonian, 61X; Rick Tejera: Was able to match the field, but try as I might I could not say with any certainty that I could see this object. Also noted that NGC 7507 should have been in the field but could not see that either.

14.5" f4.8, Dobsonian, 66X, 138X and 240X; Paul Lind: Very Small, Considerably Bright, little Extended, much brighter in middle, possible N-S orientation, no detail.

I don't know why but this galaxy, **IC 5332,** appears twice in the SAC database. Ah, finally someone identified the double star in the same field. Thanks Charlie!

8" f6, Newtonian, 150X; Charlie Whiting: this galaxy lies between a pair of 10th and 11th mag stars on its west edge and a 13th mag star on its east edge. With averted vision I could just barely detect its presence. For only a second at a time I glimpsed a very faint, almost stellar core. The halo appeared only as a ghost that vanished as soon as it appeared. There's a 7.3 mag double star, SEE 489, to the south south west. I was not able to make out its duplicity.

8" f6, Dobsonian, 61X; Rick Tejera: Seen with averted vision as a slightly elongated smudge slightly north east of a pair of bright stars the bar seemed to come and go with the seeing. Not much else noted.

14.5" f4.8, Dobsonian, 138X; Paul Lind: very Faint, considerably Large and not brighter in middle.

Call for Observations

OK, you asked for it and you will get another southerly constellation – **Fornax**. If you haven't been here before you will be in for a treat. This area is called the *Fornax Galaxy Cluster* and it is chocked full of bright, interesting galaxies. We will go to *only* location and see 8 galaxies in a one-degree field with magnitudes 9.6 down to 11.5. Yes, at least 8 galaxies, one degree! Star hop, or dial up, NGC1381 and center up RA 03 37.0 Dec –35° 19' a short 7' to the southeast. We will discuss this one field of view from west to east Be sure to jack up the power on each of these treats to what kind of additional detail waits. The first is magnitude 11.1, **NGC1374** that is a little elongated and has a little brighter middle. Next is **NGC1379** a magnitude 10.5 elliptical galaxy that is, basically, round. Now slew 28' north to **NGC1380** a nice sized, bright, barred galaxy. Can you detect any trace of the bar? To get to **NGC1381** slew 19' south. This is a small faint, magnitude 11.5 galaxy. **NGC1387** carries us south of southeast. It is another, fairly small, bright, spiral. Moving to the most southerly galaxy is **NGC1389**, yes it is in Eridanus but well worth the trip. Isn't it? Now we are getting to the eastern part of the basic field of view with **NGC1399**. This magnitude 9.6 elliptical is just a tad elongated and pretty bright. How much of this gem can you resolve? Finally, just to the southeast is **NGC1404**, another elliptical that is a little fainter than the prior one, but has a slightly higher surface brightness. Now don't expect the galaxies to appear as bright as the magnitudes indicate because they will be low on the southern horizon. Yes you may see more galaxies and not just in this field of view but if you take some time to pan around or study the field on a star chart there will be numerous bright galaxies to be seen. Oh yes, we will wait and do the planetary nebula and the Fornax Dwarf another time.

OK, after having done a couple of southerly constellations, it is time to get back to a northern one, and that one is **Triangulum**. So, for January 2010, we will leave the show piece for another time and will start with a selection of 5 galaxies and one open cluster. Beginning in the southwester part, near the Pisces border will be the elongated barred spiral **NGC 672**, which is listed as a coarse spiral. What does that mean to you? In the same 30' field is the fainter IC 1727 which is also elongated at about 90°. From this galaxy pair move about 40' to the southeast to the sole open cluster **Cr 21** containing about 15 or 20 stars with the brightest being about 8th mag. Beware the coordinates may be a little off, about 15', so you may have to pan around a little to find this, rather poor, grouping of stars. Now, moving much more to the north is the elliptical galaxy **NGC 750**. This galaxy is paired with NGC 750, they could, easily, be in contact with one another. Swing south, into the triangular part, is another elliptical, **NGC 777** along with its much fainter buddy NGC 778. Moving more to the south, almost near where we started, is the 12th mag barred spiral **NGC 784**. Quite elongated, don't you think? Moving to the very eastern part is the last of the selections, **NGC 1060**, which is said to be in the same position as NGC 1062 – watch that when you use your digital setting circles. At nearly 12th mag it should be rather faint but you should be able to detect the slightly brighter middle. While making this observation look for other field stars and galaxies. For the elliptical galaxies in this list estimate the ellipticy, that is assign the number that best describes its elongation. The number ranges from 0 for round to 7 for very elongated. No fair peeking before you observe but you should check afterwards to see how close you came with your estimates.

President's Corner

By Dick Harshaw

Okay, somebody 'fess up! You got new astro toys for Christmas. How else can we explain the really uncooperative weather we've had since the holidays? Here I sit typing this column on a Friday afternoon, in the middle of a New Moon phase, and the forecast for tonight is mostly cloudy (both here and at the Antennas). The satellite image (and loop) I just checked suggests it will be an ugly night. I was going to drive out to the Antennas tonight and try to bag some more LFGs ("little fart galaxies" as compared to Joe Goss's LTG's), but will end up staying here tonight, not even being able to open BSO for a back yard run. As Charlie Brown would say, "Rats!"

If you don't want to own up to getting new optical goodies for Christmas, we can still probably triangulate to your location and come get you. All we need to do is look at the weather maps for January and note where the cloud cover is worst, and then use Gumperson's Corollary of Flaxenheimer's Law to pinpoint from where the offense is rising. (As you may recall, Flaxenheimer's Law states that upon acquiring new optical equipment, such as a telescope or binoculars, there will be cloud cover over the observer's site for as many nights during the New Moon phases as inches of aperture acquired. Gumperson's Corollary, of course, adds that said cloud cover will have a radius equal to 2 x Pi x O squared, where Pi is 3.1416... and O is the objective's diameter in centimeters. The result given by Gumperson is stated in hecameters.)

As an illustration of this principle, suppose Rick Tejera got a new telescope for Christmas-- a 12-inch Ritchey-Chretien monster with GPS, Paramount drive, and a top-of-the-line SBIG CCD system. Rick would then expose all those around his domicle to 12 nights of cloudy skies during New Moon cycles (these MIGHT all fit in one NM cycle; if not, there will be clouds over TWO New Moon cycles), and that the radius of the cloud system, being centered over Rick's house, would extend 2 x 3.1416 x 30.48 (squared) which is 5,837 hecameters, or 583.7 km-- call it 584 km (or 363 miles). Rick's new toy would plunge most of Arizona into astronomical darkness for almost two weeks...

On an unrelated note, I see that the local True Value Hardware store here in Cave Creek has a special this week on barrels of tar and kerosene torches...

All kidding aside, I do hope that 2010 is a great year for us desert star rats, and that we get to enjoy many evenings showered by ancient photons alongside our best friends. (This is especially true for the Grand Canyon Star Party North Rim this year, June 5-12).

Full dilation and perfect exit pupils to you all!

February 2010

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

Schedule of Events for February 2010

Feb. 5th	Moon is at Last Quarter at 1915mst.
Feb. 6th	SAC Star Party at Saddle Mountain: Sunset 1809, Ast. Twilight Ends 1933, Moonrise 0244, 8:35 Hours of Dark Time
Feb. 13th	DOTM Star Party at Antennas: Sunset 1817, Ast. Twilight Ends 1941, Ast. Twilight Begins 0556, 11:39 Hours of Dark Time
Feb. 13th	Moon is New at 1951mst.
Feb. 21st	Moon at First Quarter at 2149mst.
Feb. 23rd	ATM/Astro Imagining Subgroup Meeting at Paul Lind's House at 1930
Feb. 26th	SAC General meeting at Grand Canyon University at 1930
Sept. 25th	Moon is Full at 0938mst.

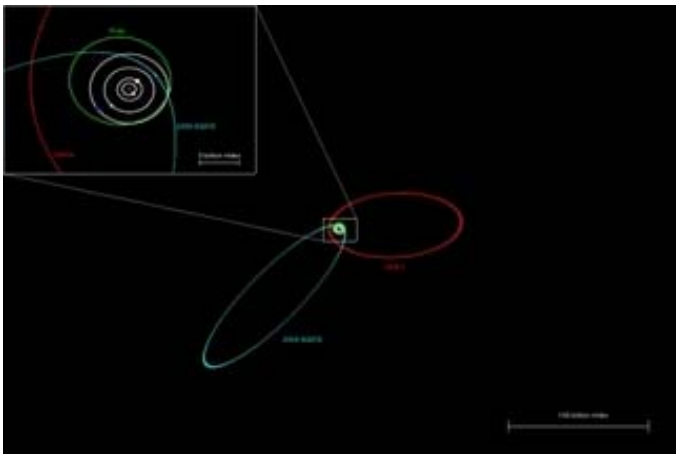
Future Planning

March 13th	2010 All Arizona Messier Marathon at Farnsworth Ranch, Arizona City. For more information: http://www.saguaroastro.org/content/messier2010.htm

The Sednoids, A New Class of Object from Deep Space?

By Ray Villard, Cosmic Ray

As if the solar system didn't seem complicated enough on the heels the Great Pluto Debate, astronomers announced yesterday (Aug. 21st, 2008) the discovery of what could be a new class of outer solar system object.



This needle-in-haystack -- 50 mile-diameter object -- was found in the Sloan Digital Sky Survey. (At more than 2 million celestial objects cataloged, it's the most comprehensive sky survey ever performed.)

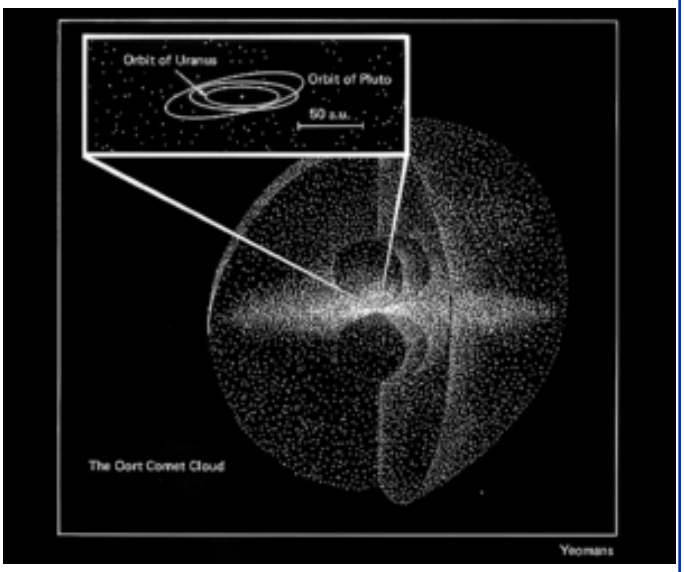
The mystery rock takes a whopping 22,500 years to complete an orbit around the sun. Its farthest point from the sun should reach the inner edge of the Oort cloud, a hypothetical shell of comets extending 100 billion to 1 trillion miles from the sun.

Right now the deep-space visitor is 2 billion miles away, inside Neptune's orbit, and beginning its outbound leg back to the Oort cloud, which it will reach by roughly before 13,300 A.D.

This breaks the record for the previous farthest know minor planet orbiting the sun, Sedna (which doesn't drift farther than 75 billion miles from the sun.)

Both Sedna and the new object, called 2006 SQ372, are *transitional objects*. They might have originated in the Kuiper belt, Pluto's nesting ground, and are being gravitationally pumped up into longer period and more eccentric orbits by Neptune's pull. Or, alternatively, they were part of the Oort cloud population and were gravitationally disrupted to fall in toward the sun.

If the later explanation is right, then SQ372 could be the first bona-fide Oort cloud object. It would provide direct observational evidence for the existence of an inner Oort cloud.



The problem is that solar system dynamics are "time-reversible." You don't know if objects like these are coming or going in terms of their place of origin.

One way to try and settle its pedigree is to measure the interloper's color and see if it looks more like a Kuiper belt object or not. For example, Sedna is especially mysterious in that it is the reddest object in the solar system – even redder than Mars. So it doesn't *look* like a Kuiper belt object.

In all likelihood the gravitational pull of the outer

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(Continued from page 8)
planets will decide the fate of SQ327. The orbit will either be expanded or shrunken depending on the nature of the encounter with planets.

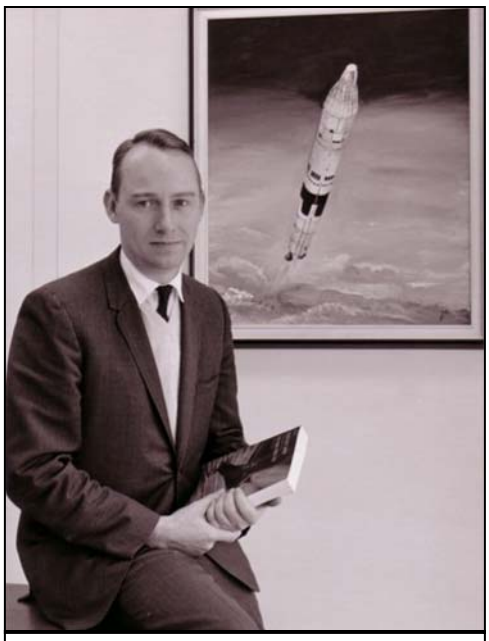
When Sedna was discovered in 2004 it was recognized as a strange new type of object, having the longest orbital period for any minor planet, 10,500 years. Sedna is 20 times larger that SQ372.
This discovery leaves little doubt there are many other such transitional objects that shuttle between the Kuiper belt and the Oort cloud. The object SQ372 was only detected because it is at its closest approach to the Sun, making it bright enough to be seen in the Sloan survey.
You could call these icy bodies *Monster Comets*, but then they would wind up being talked about in the tabloids alongside Bigfoot articles.
Now that two such object are know to travel this far beyond the Kuiper belt the outermost solar system, I'm proposing a new name before the International Astronomical Union gets into the act: *Sednoids.*

Monthly Trivia Question

This month's question: What was a Hybrid Lunar trajectory?

Last Month's Answer: What was a "Tindallgram"?

A Tindallgram was the whimsical name given to memos from Howard Wilson (Bill) Tindall. Tindall was the "Chief of Apollo Data Priority Coordination". He chaired meetings between astronauts, mission controllers, design engineers, contractors, and other relevant parties, adjudicating disagreements and overseeing the details of planning mission techniques. He was able to sort through the many different aspects of mission planning and decide what would be done.



Howard Wilson "Bill" Tindall 1925-1975

His memo (remember, Tindallgrams?) were known for their light and informal style and witty titles. However they were taken seriously by all who read them.

He was also able to consider things that other wise might have gone unnoticed or could have caused unforeseen problems.

Two examples of this was his warning that the guidance had gotten so accurate on recovery that the space craft could come close enough to the recovery ships to cause a collision hazard. His recommendation to move recovery forces further away from the splashdown point was justified when Apollo 8 flew over the prime recovery ship, USS Yorktown.

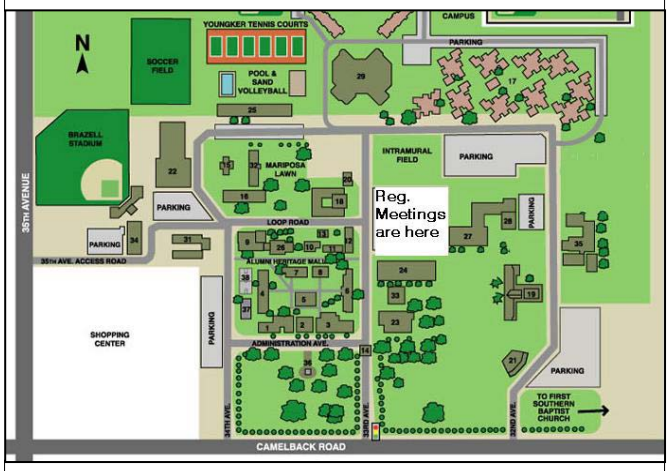
Also, while planning the first landing, there were two opportunities right after touchdown to determine if it was safe to remain on the surface. These were originally called Go/no o points. Tindall pointed out in the heat of the moment a "go" could be interpreted as "Get the heck out", and suggested they changed them to Stay/No Stay.

Tindall is credited by many as being the one person who enabled the Apollo program to meet President Kennedy's goal of landing on the moon by the end of the decade.

For a collection of Tindallgrams, go to: http://en.wikipedia.org/wiki/Bill_Tindall

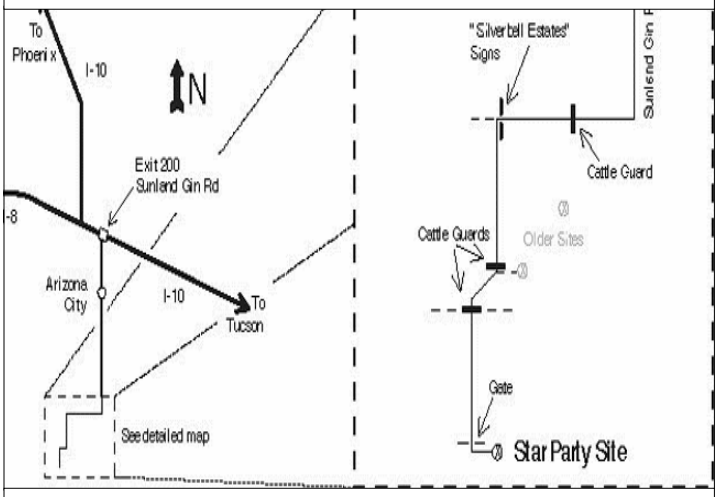
SAC Member Services

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 1-1 0 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 f our miles, the main road will turn south just after the "Silverbell Estates" signs. Three miles past the signs, the road will veer of f to the west, and five miles further, the road will pass through a gate. Turn left immediately after the gate and continue f or 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-2010

Date	Sunset	Moonset	Eve. Twi.	Morn. Twi./Sun Rise	Location
February 13th	1817	-	1941	TW: 0556	Antennas
March 13th (Messier Marathon)	1833	-	1955	MR: 0548	Arizona City
April 10th	1902	-	2028	MR: 0424	Antennas
May 15th	1924	2134	2102	TW: 0347	Cherry II
July 10th	1943	-	2127	TW: 0341	Cherry II
August 14th	1829	2200	2049	TW: 0417	Cherry II
September 11th	1841	2036	2006	TW: 0444	Cherry II
October 9th	1808	1920	1930	TW: 0513	Antennas
November 6th	1738	1756	1902	TW:: 0534	Antennas
December 4th	1726	-	1854	TW: 0556	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%.

- ☐ $32.00 Individual Membership
- ☐ $48.00 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:_____

Address:_____

City:_____ St:_____ Zip:_____

Phone:_____

E-Mail:_____

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

SAC Treasurer
c/o David Fredericksen
6222 W Desert Hills Dr.
Glendale, AZ 85304

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

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 your prefer a printed copy.

☐ **Please send me a hard Copy of the newsletter**

SAGUARO ASTRONOMY CLUB

January 2010

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Videmus Stellae

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SAC Schedule of Events 2010

SAC Meetings

January 29, 2010	July 23rd, 2010
February 26, 2010	August 20th, 2010
March 26th, 2010	September 24th, 2010
April 30th, 2010	October 22nd, 2010
May 28th, 2010	November 19th, 2010
June 25th, 2010	2010 Holiday Party, TBA

Future Planning

March 13th, 2010	2010 All Arizona Messier Marathon
June 5th-12th, 2010	Grand Canyon Star Party
June 11th-12th, 2010	5 Mile Meadow Star Party

SAC Star Parties

Date	Sunset	Astronomical Twilight Ends	Moonrise	Site
Jan. 9th, 2010	1742	1910	0351	S
Feb. 6th, 2010	1809	1933	0244	S
Mar. 6th, 2010	1833	1955	0131	S
Apr. 3rd, 2010	1854	2019	0014	S
May 8th, 2010	1919	2054	0245	C
Jun. 5th, 2010	1939	2123	0140	C
Jul, 3rd, 2010	1945	2130	2340	C
Aug 7th, 2010	1924	2059	0357	C
Sep. 4th, 2010	1850	2017	0246	C
Oct. 2nd, 2010	1811	1934	0138	C
Oct. 30th, 2010	1742	1906	0040	S
Nov. 27th, 2010	1725	1852	2339	S

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