ANTELOPE VALLEY ASTRONOMY CLUB, INC.

Desert Sky Observer

Volume 29 *Antelope Valley Astronomy Club Newsletter* **July 2009**

Up-Coming Events

July 10: Club Meeting* – This month's speaker is Chris Butler
July 11: Lunar Club meeting @ Pedroza Flats
July 13: Board Meeting @ Don's house
July 25: Dark Sky Star Party @ Mt. Pinos

* Monthly meetings are held at the S.A.G.E. Planetarium on the Cactus School campus in Palmdale, the second Friday of each month. The meeting location is at the northeast corner of Avenue R and 20th Street East. Meetings start at 7 p.m. and are open to the public. *Please note that food and drink are not allowed in the planetarium*

President

Don Bryden

I've just returned from Mt. Piños. It was good to be up on the mountain and to see the summer constellations rising. The rich star fields and globulars of Sagittarius and Ophiuchus were just what I needed to work on for my Messier pin. Though not required, I've decided to sketch each object. The Astronomical League suggests that you spend some time at the eyepiece with each object and not just "check off" one after another.

About 1:30 Sunday morning this became a very tedious task as I had a heavy coat and gloves on. Oh well, maybe it'll be warmer by the next star party. If you've not been to Mt. Piños, you owe it to yourself to see the stars from 8300 feet!

Even though it was cold and windy in the Antelope Valley, it was actually a very nice day up on Piños. And we had a great turnout! From Leon on one end to Terry at the other we must have had half the scopes up there. Matt and his boys, Frank and Rose, Darrell and Nick, Doug, Me, Shane and Karole rounded out the center of the parking lot. Once again Frank and I were the last to pack it in. We waited for Jupiter to clear the tree line and then gave in to the wind and cold. BTW, Shane gets the Doug Drake star party award this time. He was remarking as he packed his gear that he kept dropping everything. Soon after, I heard a loud crash and a yelp as we watched his tripod and new wedge go crashing to the ground.

Still, Shane got some excellent wide field images of the Milky Way and, by chance, a nice Irridium flare that hit maximum just where his camera was pointed.

I hope to see everyone at the next club meeting, July 10th. Come out and hear a talk by Chris Butler on the stars of the Southern hemisphere. Then, let's go back to the mountain on the 18th for another great night on Mt Piños!

-Don Bryden

Vice President

Rose Moore

It's officially summer, and here's hoping for clear skies and warmer weather at Mt. Piños for next month! We had a good turnout by our club for Mt. Piños for June. And everyone had a great time observing, despite the cold weather at night!

Come out to our July club meeting at the SAGE and enjoy Chris Butler's presentation 'Under the Southern Stars'!

We are looking forward to having Chris back to visit us!

September's meeting will be Doug Drake's presentation on Cosmology, and November's meeting will be Matt and Jeremy's presentation on Messier objects.

We have the club picnic coming up on August 22nd, at 3pm at Mt. Trotta. Please make sure you sign up for something to bring to the picnic. If you can't be at the meeting to sign up, please call or email me or one of the board members. Also, if you have an item to donate for the silent auction or raffle, please contact me. We will be observing after the picnic so bring any equipment and come observe with fellow club members!

Clear skies!
Rose

Director of Community Development

Karole Barker

The turnout for Prime Desert Woodlands on May 16th was great. We had 154 people show up for the event, in addition to 14 club members. The next three Prime Desert Woodlands will be held on June 27th @ 8:30 p.m., July 25th @ 8:30 p.m. & August 29th @ 8:00 p.m. We still need volunteers to bring out scopes those nights. Please let me know if you can make it.

Our club is now confirmed for a 1/2 night at Mt. Wilson on Saturday September 19th. The cost for the night is $900.00. We have 25 people going, so the cost will be $36.00 per person. Right now the signup sheet is closed, since we already have 25 people signed up for the night. I will keep you posted.

RTMC this year was a lot of fun. We had great weather this year and great viewing of the night sky. In addition, we had a couple of members win at the big raffle each night. Plus, everyone had fun shopping for new equipment and various astronomy items.

July 1st is the 2nd year CAP (Civil Air Patrol) on Edwards Air Force Base and once again they have invited our club to do a private star party for the cadets. For those club members that have signed up, I will be sending out more information before the event. The signup sheet for this event is officially closed.

Clear skies,
Karole

Secretary

Frank Moore

By default, or by design, I seem to have been sitting in the right chair, at the wrong time, or "vice versa", and find myself serving the AVAC as Secretary. As I got into this astronomy stuff "through the back door", via marriage to Rose, I suppose it's fitting that I seem to have entered service on the Executive Board in this manner as well. I'm happy to serve and will do my best.

Though I have now pretty well embraced the hobby as my own, many of you may know I have called myself Rose's "mount mechanic" for years and that I have seen my role as keeping her astronomy equipment running and fighting legal and political battles to preserve what's left of the night skies. In that regard, I'm a member of the International Dark Sky Association and have written many letters and appeared before the Kern County Planning Commission and Board of Supervisors on numerous occasions.

This past weekend, by my count, our club had 20 members present, with 13 telescopes, at our Dark Sky Party on Mt. Piños. This is still one of the best "Dark Sky" sites in California but that distinction may be threatened by numerous developments proposed for Kern and Los Angeles counties.

These developments include "**Frazier Park Estates**" which would encompass an area bounded on the east by Interstate 5, on the west by Lockwood Valley Rd., and on the south side of Frazier Mountain Road. This is the closest to Mt. Piños of all of the proposed developments.

This proposal includes amendments to the Frazier Park/Lebec Specific Plan and would involve the construction and operation of a master-planned community with a mix of uses including, but not limited to:

- 662 single-family homes
- 41 multifamily units
- 35.63 acres of general commercial and community service facilities, including:
  - 97,475 square feet of various commercial stores and restaurants
  - 9.83 acres for a landscaping nursery
  - 43,000 square feet of community service facilities
  - Wastewater treatment plant
  - 7.5-acre park
  - Sports field; (with lights)

The second Kern County Development is "**Tejon Mountain Village**". The project site, in southwestern Kern County, starts on the east side of Interstate 5, just to the east of the Frazier Park/Lebec area, and consists of 26,417 acres. This development is so big that it has the propensity to also affect the night skies for members living in the Tehachapi, Rosamond, and western Antelope Valley areas as well.

The proposed Tejon Mountain Village project includes the following characteristics:

- 3,450 residences ranging in lot sizes from 2,400 square feet to over 20 acres
- Up to 160,000 square feet of commercial
- Various hotel, spa, and resort facilities, which include up to 750 lodging units
- Up to 350,000 square feet of facilities in support of the following specific uses
- Two 18-hole golf courses (36 total holes)
- Riding and hiking trails
- Equestrian facilities

- Two helipads
- Fire stations
- Private community centers
- Electrical sub-station facilities
- Permanent and interim water treatment and wastewater treatment
- Ranchland and other undeveloped open space

Project development would occur with an approximately 7,867-acre development envelope of which a total of approximately 5,082 acres would be developed at full build out. Approximately 21,335 acres (80%) of the site would be permanently preserved as ranchland and other undeveloped open space by the project.

In regard to addressing dark sky issues, the developers, and Kern County Planners, should be commended in that these developments, and the "Specific Plan" amendments associated with them, incorporate the latest suggestions from the International Dark. Some fine tuning is necessary, but the initial effort is great. That said, there are many other environmental issues that have not, or cannot be mitigated, like air pollution, traffic, and water usage. Also, the cumulative effect of these developments, and others proposed in neighboring counties, could still be devastating for the night skies of Mt. Piños.

The Draft Environmental Impact Reports for the Kern County Projects can be found at this URL: http://www.co.kern.ca.us/planning/pdfs/eirs/envirodoc.pdf These are massive documents and it takes some effort to wade through them all.

The public comment period for both of these developments closes on July 13, 2009 with hearing before the Kern County Board of Supervisors on August 13, 2009.

I shall be submitting my concerns, and proposed mitigation measures to the Board of Supervisors, and hope some of you will choose to do so as well.

Other proposed developments that have the propensity to adversely affect the viewing at Mt. Pinos include, but are not limited to:

Gorman Post Ranch LLC Residential Project

Los Angeles County published an NOP dated January 10, 2007, to prepare an EIR for this project. This project proposes construction of:

- 531 single family homes on 406 acres
- two single-family ranch lots on 306 acres
- 18 open-space lots on 1,875 acres
- one 7-acre water tank
- six debris basins on 8 acres
- one sewer pump station on 1 acre
- five street lots on 98 acres

Centennial Specific Plan

Los Angeles, County. The project site consists of 12,000 acres located 1 mile east of I-5 and adjacent to State Highway 138. The project includes a specific plan and subdivision for a master planned community. The Centennial Specific Plan proposes a maximum of 23,000 dwelling units and 14 million total square feet of non-residential development of employment areas (12,233,390 square feet) and retail serving centers (1,986,336 square feet), anticipated to be built over a period of approximately 20 years.

Dark Skies,
Frank Moore

Extraterrestrial Tidbits by Jeff Riechmann

July 11/12 marks the 30th anniversary of the return of Skylab to earth, breaking up upon re-entry with pieces of the spacecraft landing in the Pacific Ocean and the Australian Outback. Launched on May 14, 1973, Skylab 1 was the unmanned mission that placed Skylab in orbit. When a shield designed to protect the station from meteor impacts was deployed early and destroyed, taking two solar panels with it, it was feared that Skylab would be lost. Eleven days later, Skylab 2 (Pete Conrad, Joseph Kerwin, and Paul Weitz) would be launched and repairs would be made to salvage the station. Skylab 2 would splash down on June 22, 1973. Skylab 3 (Al Bean, Jack Lousma, and Owen Garriot) would be launched on July 28, 1973 returning 59 days later. November 16, 1973 would be the date that Skylab 4 (Gerald Carr, Bill Pogue, and Edward Gibson) would be launched on its 84 day mission, splashing down February 8, 1974, leaving Skylab uninhabited. Five years later it would make its return to earth. So much for burning up in the atmosphere!

Space Place

The Cool Chemistry of Alien Life

Alien life on distant worlds. What would it be like? For millennia people could only wonder, but now NASA's Spitzer Space Telescope is producing some hard data. It turns out that life around certain kinds of stars would likely be very different from life as we know it.

Using Spitzer, astronomers have discovered the organic chemical acetylene in the planet-forming discs surrounding 17 M-dwarf stars. It's the first time any chemical has been detected around one of these small, cool stars. However, scientists are more intrigued by what was *not* there: a chemical called hydrogen cyanide (HCN), an important building block for life as we know it.

"The fact that we do not detect hydrogen cyanide around cool stars suggests that that prebiotic chemistry may unfold differently on planets orbiting cool stars," says Ilaria Pascucci, lead scientist for the Spitzer observations and an astrophysicist at Johns Hopkins University in Baltimore, Maryland.

That's because HCN is the basic component for making adenine, one of the four information-carrying chemicals in DNA. All known life on Earth is based on DNA, but without adenine available, life in a dwarf-star solar system would have to make do without it. "You cannot make adenine in another way," Pascucci explains. "You need hydrogen cyanide."

M-dwarf and brown dwarf stars emit far less ultraviolet light than larger, hotter stars such as our sun. Pascucci thinks this difference could explain the lack of HCN around dwarf stars. For HCN to form, molecules of nitrogen must first be split into individual nitrogen atoms. But the triple bond holding molecular nitrogen together is very strong. High-energy ultraviolet photons can break this bond, but the lower-energy photons from M-dwarf stars cannot.

"Other nitrogen-bearing molecules are going to be affected by this same chemistry," Pascucci says, possibly including the precursors to amino acids and thus proteins.

To search for HCN, Pascucci's team looked at data from Spitzer, which observes the universe at infrared wavelengths. Planet-forming discs around M-dwarf stars have very faint infrared emissions, but Spitzer is sensitive enough to detect them.

HCN's distinctive 14-micron emission band was absent in the infrared spectra of the M-dwarf stars, but Spitzer did detect HCN in the spectra of 44 hotter, sun-like stars.

Infrared astronomy will be a powerful tool for studying other prebiotic chemicals in planet-forming discs, says Pascucci, and the Spitzer Space Telescope is at the forefront of the field. Spitzer can't yet draw us a picture of alien life forms, but it's beginning to tell us what they could—and could not—be made of. "That's pretty wonderful, too," says Pascucci

For news of other discoveries based on Spitzer data, visit http://www.spitzer.caltech.edu. Kids can learn Spitzer astronomy words and concepts by playing the Spitzer "Sign Here!" game at http://spaceplace.nasa.gov/en/kids/spitzer/signs.

Do alien planets around other stars have the right ingredients for a pre-biotic soup?

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

Shedding Light on Black Holes by Tom Koonce

Black Holes... Just their name sounds like something out of science fiction. Maybe this is one reason why they have been the focus of misconceptions and misguided theories. This month, the theme of the International Year of Astronomy is centered on the objects that weigh heavily (pun intended) on the minds of theoretical physicists and leading astronomers… Black Holes.

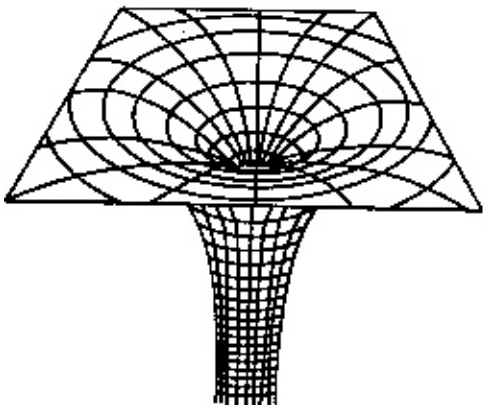
First a bit of background on the subject.

The gravitational force exhibited by a celestial body is directly related to its mass and inversely proportional to the square of the distance which the object is away from that mass. So how does a black hole generate its enormous gravity even though its mass is reduced to an infinitesimal point?

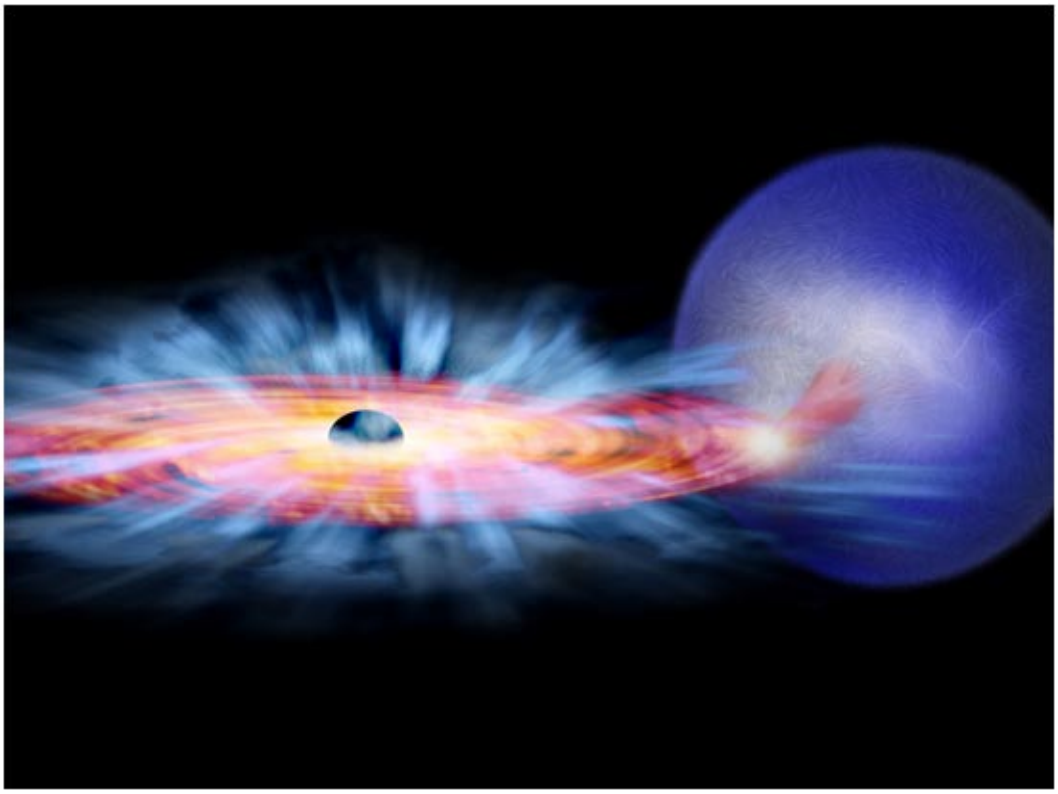
Consider a star with the mass and radius of the red supergiant Betelgeuse. Under normal circumstances, an object could orbit the star at a distance outside of Betelgeuse's stellar atmosphere. But if the entire mass of Betelgeuse was compressed down to become a black hole and in the absence of Betelgeuse's stellar atmosphere, the object could pass much closer to the black hole's center of mass… so close, in fact, that the gravitational force it could experience would be incredibly high.

Another concept to realize is that if the Sun were to suddenly be replaced with a black hole of equal mass, the Earth would continue to orbit it in the exact same manner as it does today, except that the lack of sunlight would render the Earth incapable of sustaining life.

A common question that comes up during casual conversation about this subject is, "If I went through a black hole, where would I go?" The straight-forward blunt answer? "To your death!" You literally would be torn to pieces by the gravitational tidal forces during your approach to the event horizon and then, with unerring certainty, what gelatinous mess remained would be squashed much, much flatter than a pancake as your remains fell deeper into the gravity well. Black holes are not a mode of transportation to another universe, but they are efficient "matter compactors," sweeping up all mass that passes too near. Of course they can't draw in matter from light years away, but as matter falls into a black hole it becomes (perhaps) infinitely compressed by its overwhelming gravitational force.



Imagine what a black hole looks like and you probably picture the graphic popularized by the media; a two dimensional plane with a funnel-shaped hole descending towards the black hole's singularity. This stylized perception of the three dimensional nature of the object has misled many people to think of a black hole as a hole in space, like a hole in the backyard, or perhaps a tunnel in space-time leading to other parts of our own universe. The event horizon is a spherical region around the black hole, inside of which the black hole's gravity is so strong that nothing can achieve escape velocity - nothing, not even light. Because light can't escape, space artists have envisioned the object as a black blob against a field of distant stars. This black blob is surrounded by a fairly bright disk of material caught in the gravitational field. Why is it bright? As all of the dust and matter spirals in closer to the black hole it is rubbing against other matter, heating it up by friction until it gets to millions of degrees. It is this dust outside of the event horizon that is radiating light.



This is an artist's representation of GRO J1655-40, a binary star system observed in April 2005 by Chandra. This binary consists of a black hole and a normal star shown in blue. Gas is being pulled away from the star and falling onto a red disk spinning around the black hole. Some of this gas spirals in towards the black hole, generating copious amounts of light along the way. Credit: NASA

What would a glimpse below the event horizon look like? How important would it be to you to find out? It would be a one-way trip to find out. Nothing, not even light, can escape from below the event horizon… but photons of light could orbit the black hole. Since there is an equivalent mass for the energy of a photon ($E = mc^2$), light is affected by gravitational forces. Photons can orbit a black hole if conditions are right. Since there are photons continuously falling into black holes, many must get trapped in this manner. We can't see the photons because they are orbiting and not radiating outward and striking our retinas. If we were somehow able to glimpse just below the event horizon, on that one way trip into gravitational flatness, I believe you would see bright light surrounding you; you would see photons instead of blackness. Your final view would be of all of the light shed upon the black hole.

Did you know ? ? ?

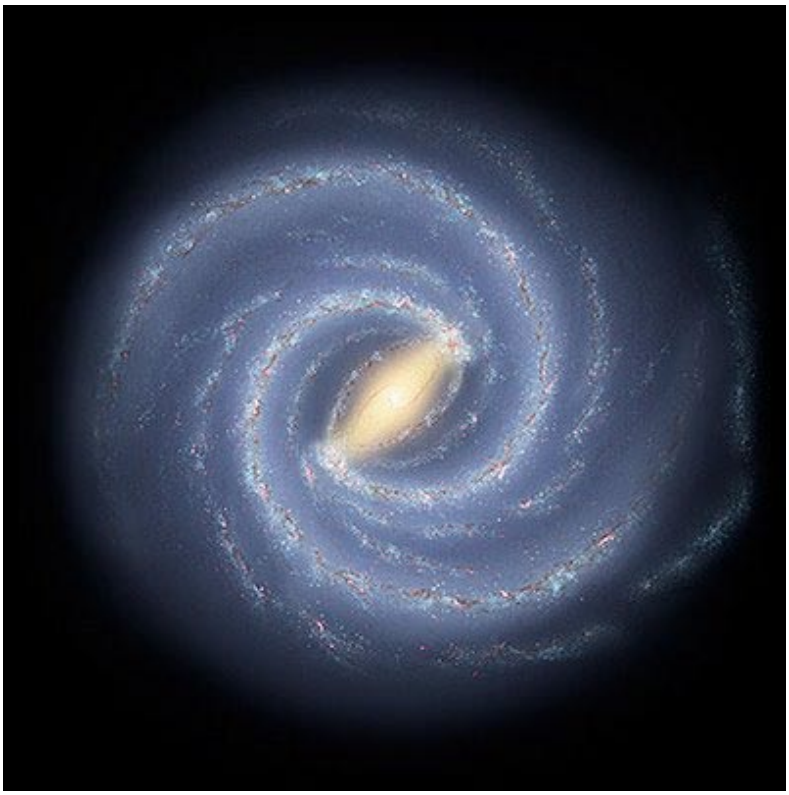
The event horizon is like the border of the black hole – once you cross that line, you're going to be sucked in. There's no escape. Even before crossing the event horizon, though possible to travel away from the black hole, it is not easy. Even light has a hard time getting out, so light being emitted from something almost at the Event Horizon but not yet inside the threshold takes a much longer time to escape and be seen by someone then it would in normal space going at 186,000 miles per second.

International Year of Astronomy

Black Holes

Before the bright lights of cities outshone the wonders of the night sky, the Milky Way was a common sight for most of the world. Legends from various cultures described this region as a road, a river, or a flock of birds. The Greeks and Romans thought the haze looked like milk, which is where the name Milky Way comes from. When Galileo pointed his small telescope towards this band of light, he didn't see milk or birds. "The Milky Way is nothing else but a mass of innumerable stars planted together in clusters." We know now that the Milky Way Galaxy is indeed a collection of gas, dust and billions of stars, including our Sun.

But there is more to the galaxy than stars, gas, and dust. There are also black holes. In the dense center of the Milky Way, there is good evidence that a supermassive black hole exists with over 2 million times the mass of our Sun. Scientists have good evidence that most large galaxies contain giant black holes in their centers. But we can't point a telescope at a black hole and see it directly. We only see their effect on the things around them, like stars and gas. In fact, the mass of a black hole is determined using physics developed by Galileo's contemporary, Johannes Kepler.



There is a smaller, more common type of black hole with only a few times the mass of our Sun. These are the remains of giant stars that end their lives in a supernova explosion. If there is enough mass left at the core of the star after the explosion, it collapses to a point, creating a region of gravity so strong that not even light can escape.

This makes finding black holes a little bit tricky. But scientists love a challenge. As it turns out, when material falls into a black hole, it gets heated up to millions of degrees releasing high energy radiation like x-rays before it is lost forever. So searching for sources of x-rays is another way to detect black holes, and this is how NASA's Chandra Observatory studies the black hole at the center of our galaxy. Scientists are also using x-rays to research the behavior of black holes with the Suzaku and XMMNewton space observatories. The Hubble Space Telescope has even discovered medium sized black holes. With future generations of telescopes, like the James Webb Space Telescope, astronomers will be able to go deeper in their understanding of black holes and the role of the black holes in galaxy evolution.

Learn more about Black Holes from NASA.

News Headlines

NASA Successfully Launches Lunar Impactor
NASA successfully launched the Lunar Crater Observation and Sensing Satellite, or LCROSS, Thursday on a mission to search for water ice in a permanently shadowed crater at the moon's south pole. The satellite lifted off on an Atlas V rocket from Cape Canaveral Air Force Station, Fla., at 5:32 p.m. EDT, with a companion mission, the Lunar Reconnaissance Orbiter, or LRO.
http://www.nasa.gov/home/hqnews/2009/jun/HQ_09-143_LCROSS_Launch_Success.html

Dawn Switches Back To Ion Propulsion System
Having completed the longest planned coasting period of its entire mission, Dawn is now back to its familiar routine. On June 8, the ion propulsion system was called back into action to propel the probe to its rendezvous with asteroid Vesta.
http://www.spacedaily.com/reports/Dawn_Switches_Back_To_Ion_Propulsion_System_999.html

Solar Sleuths Tackle the "Quiet Sun"
For the past couple of years, our Sun has been at the minimum of its 11-year activity cycle. Its face has been virtually spotless for months on end, and there've been no dire alerts of titanic solar storms about to slam into Earth.
http://www.skyandtelescope.com/news/48607432.html

Precision Technique Provides Vital Tool For Unraveling Mystery Of Dark Energy
Radio astronomers have directly measured the distance to a faraway galaxy, providing a valuable "yardstick" for calibrating large astronomical distances and demonstrating a vital method that could help determine the elusive nature of the mysterious Dark Energy that pervades the Universe.
http://www.sciencedaily.com/releases/2009/06/090608131140.htm

New Definition Could Further Limit Habitable Zones Around Distant Suns
As astronomers gaze toward nearby planetary systems in search of life, they are focusing their attention on each system's habitable zone, where heat radiated from the star is just right to keep a planet's water in liquid form.
http://www.sciencedaily.com/releases/2009/06/090610124831.htm

Planetary Preemies?
Protoplanetary disks around three young stars in Ophiuchus have large central holes, astronomers have found, which were presumably cleared by still-growing Jupiter-mass planets. But there’s a problem: the stars are too young. How would planets have formed in just a couple million years?
http://www.skyandtelescope.com/news/47927597.html

Milky Way's super-efficient particle accelerators caught in the act
Thanks to a unique "ballistic study" that combines data from European Southern Observatory's (ESO) Very Large Telescope (VLT) and NASA's Chandra X-ray Observatory, astronomers have now solved a long-standing mystery of the Milky Way's particle accelerators. They show that cosmic rays from our galaxy are very efficiently accelerated in the remnants of exploded stars.
http://www.astronomy.com/asy/default.aspx?c=a&id=8406

July Sky Data

Best time for deep sky observing this month:
July 18 through July 23

Mercury is at *superior conjunction* (almost directly behind the Sun) on July 14th. We are very unlikely to see this elusive little planet, this month.

Venus is rising two or three hours before the Sun, and by dawn it shines a hand's-breadth above the eastern horizon. Although it is low in the twilight sky, the "Morning Star" is so bright that it can be picked up easily, in clear conditions.

At the start of July, **Mars** appears very close to Venus in the eastern sky at dawn; it's a little higher and further right, just 4 degrees away. As the month goes by, the orientation of the two planets stays much the same, but the gap opens up; by the end of July, Mars is 15 degrees to the upper right of Venus. But the Red Planet is far further away than Venus, and it looks *much* fainter – just like a dim yellowish dot. Even in the telescope, its disc appears so tiny (only 5 arc-seconds across) that no detail will be visible.

Jupiter is rising in the south-east before midnight, and it is well up in the southern sky at dawn. Relative to the stars, the giant planet is moving very slowly westwards in Capricornus, much lower down than the three bright stars of the "Summer Triangle". But, although it's so low down, Jupiter should still outshine any of the real stars.

Saturn is in the western sky at dusk. At the start of July, it doesn't set until after midnight, but by the end of the month it disappears at 10:30pm. Relative to the stars it is moving slowly south-east, in the constellation of Leo, well to the left of the bright star Regulus and a little higher up. Saturn appears a little brighter than Regulus, and it shines with a steady, untwinkling light, slightly creamier in color than the blue-white star.

There are various minor **meteor-showers** which are active in July, mainly with radiants in the Capricornus-Aquarius area. Towards the end of the month we may also start to see the first of the **Perseids**, which peak in August.

Sun and Moon Rise and Set

Date	Moonrise	Moonset	Sunrise	Sunset
7/1/2009	15:31	01:16	05:42	20:08
7/5/2009	19:15	04:02	05:44	20:08
7/10/2009	22:06	08:46	05:47	20:07
7/15/2009	------	13:41	05:50	20:05
7/20/2009	04:01	19:09	05:53	20:02
7/25/2009	10:07	22:15	05:57	19:59
7/31/2009	16:20	01:11	06:01	19:54

Planet Data

July 1

	Rise	Transit	Set	Mag
Mercury	04:40	12:08	19:23	-1.1
Venus	02:54	09:55	16:56	-4.1
Mars	02:33	09:38	16:43	1.1
Jupiter	22:38	04:11	09:43	-2.7
Saturn	10:56	17:30	00:01	1.0

July 15

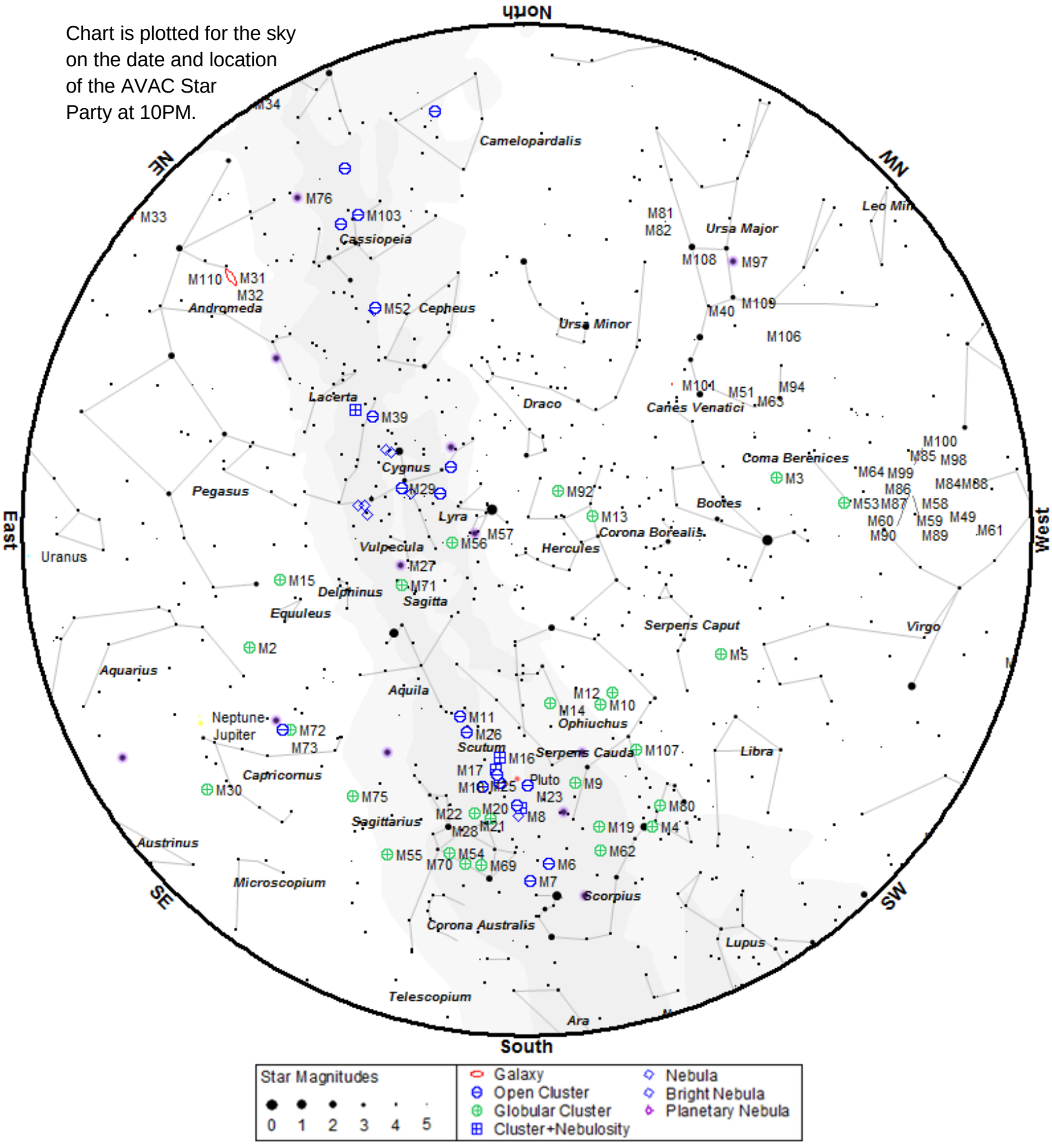
	Rise	Transit	Set	Mag
Mercury	05:56	13:13	20:35	-1.9
Venus	02:52	10:04	17:14	-4.1
Mars	02:11	09:23	16:36	1.1
Jupiter	21:40	03:12	08:43	-2.8
Saturn	10:06	16:39	23:09	1.1

July 31

	Rise	Transit	Set	Mag
Mercury	07:26	14:15	21:07	-0.4
Venus	03:00	10:18	17:35	-4.0
Mars	01:48	09:07	16:26	1.1
Jupiter	20:33	02:02	07:31	-2.8
Saturn	09:11	15:42	22:10	1.1

Planet, Sun, and Moon data calculated for local time at Lancaster, CA

Chart is plotted for the sky on the date and location of the AVAC Star Party at 10PM.



Star Magnitudes		
0 1 2 3 4 5	Galaxy	Nebula
	Open Cluster	Bright Nebula
	Globular Cluster	Planetary Nebula
	Cluster+Nebulosity	

To use the chart, go outside within an hour or so of the time listed and hold it up to the sky. Turn the chart so the direction you are looking is at the bottom of the chart. If you are looking to the south then have 'South horizon' at the lower edge.

Suggested Observing List

The list below contains objects that will be visible on the night of the AVAC Star Party. The list is sorted by the best time to observe the object. The difficulty column describes how difficult it is to observe the object from the current location on a perfect night in a 6 inch Newtonian telescope.

ID	Cls	Mag	Con	RA 2000	Dec 2000	Begin	Best	End	Difficulty
M 49	Gal	9.3	Vir	12h29m46.8s	+08°00'01"	21:24	21:42	22:21	detectable
M 86	Gal	9.8	Vir	12h26m12.2s	+12°56'44"	21:27	21:43	21:44	detectable
M 84	Gal	10.1	Vir	12h25m03.9s	+12°53'12"	21:26	21:43	22:22	detectable
M 87	Gal	9.6	Vir	12h30m49.2s	+12°23'29"	21:26	21:43	21:46	detectable
NGC 5986	Glob	7.6	Lup	15h46m03.0s	-37°47'12"	21:23	21:43	22:38	detectable
NGC 4565	Gal	10.1	Com	12h36m20.8s	+25°59'15"	21:30	21:46	22:26	difficult
M 64	Gal	9.3	Com	12h56m43.8s	+21°41'00"	21:24	21:46	22:35	detectable
NGC 5897	Glob	8.4	Lib	15h17m24.0s	-21°00'36"	21:27	21:47	21:59	difficult
M 106	Gal	9.1	CVn	12h18m57.6s	+47°18'13"	21:27	21:49	22:54	detectable
M 94	Gal	8.7	CVn	12h50m53.1s	+41°07'12"	21:25	21:49	23:12	easy
M 3	Glob	6.3	CVn	13h42m11.0s	+28°22'42"	21:24	21:49	23:37	easy
M 82	Gal	9.0	UMa	09h55m52.4s	+69°40'47"	21:27	21:50	00:08	easy
NGC 5195	Gal	10.5	CVn	13h29m59.6s	+47°15'58"	21:27	21:51	23:38	detectable
M 51	Gal	8.7	CVn	13h29m52.3s	+47°11'40"	21:24	21:51	00:05	easy
M 5	Glob	5.7	Ser	15h18m34.0s	+02°05'00"	21:21	21:50	00:04	easy
NGC 6124	Open	6.3	Sco	16h25m20.0s	-40°39'12"	21:28	21:50	22:34	difficult
NGC 6167	Open	6.6	Nor	16h34m34.0s	-49°46'18"	21:19	21:50	23:02	easy
M 101	Gal	8.4	UMa	14h03m12.4s	+54°20'53"	21:27	21:52	00:03	detectable
M 80	Glob	7.3	Sco	16h17m02.0s	-22°58'30"	21:22	21:53	22:34	detectable
NGC 6178	Open	7.2	Sco	16h35m47.0s	-45°38'36"	21:16	21:53	23:35	easy
NGC 6193	Open	5.4	Ara	16h41m20.0s	-48°45'48"	21:18	21:54	23:18	easy
M 13	Glob	5.8	Her	16h41m41.0s	+36°27'36"	21:20	22:05	02:31	easy
M 12	Glob	6.1	Oph	16h47m14.0s	-01°56'48"	21:21	22:05	01:17	easy
M 10	Glob	6.6	Oph	16h57m09.0s	-04°06'00"	21:24	22:10	01:09	detectable
M 62	Glob	6.4	Oph	17h01m13.0s	-30°06'48"	21:22	22:12	00:24	detectable
M 19	Glob	6.8	Oph	17h02m38.0s	-26°16'06"	21:25	22:13	00:23	detectable
M 92	Glob	6.5	Her	17h17m07.0s	+43°08'12"	21:22	22:26	03:12	easy
M 9	Glob	7.8	Oph	17h19m12.0s	-18°31'00"	21:25	22:28	00:24	detectable
NGC 6322	Open	6.5	Sco	17h18m25.0s	-42°56'00"	21:17	22:27	00:38	easy
NGC 6383	Open	5.4	Sco	17h34m48.0s	-32°34'00"	21:20	22:44	01:09	easy
NGC 6388	Glob	6.8	Sco	17h36m17.0s	-44°44'06"	21:29	22:45	00:16	detectable
M 14	Glob	7.6	Oph	17h37m36.0s	-03°14'48"	21:25	22:46	01:49	detectable
M 6	Open	4.6	Sco	17h40m20.0s	-32°15'12"	21:18	22:49	01:27	easy
NGC 6543	PNe	8.3	Dra	17h58m33.4s	+66°37'59"	21:11	23:02	04:50	obvious
M 7	Open	3.3	Sco	17h53m51.0s	-34°47'36"	21:24	23:02	01:14	easy
M 23	Open	5.9	Sgr	17h57m04.0s	-18°59'06"	21:24	23:06	00:58	detectable
M 20	Open	5.2	Sgr	18h02m42.0s	-22°58'18"	22:04	23:11	00:19	easy
M 8	Neb	5.0	Sgr	18h04m02.0s	-24°23'14"	22:32	23:13	23:53	easy

ID	Cls	Mag	Con	RA 2000	Dec 2000	Begin	Best	End	Difficulty
M 21	Open	7.2	Sgr	18h04m13.0s	-22°29'24"	21:59	23:13	00:27	detectable
NGC 6541	Glob	6.3	CrA	18h08m02.0s	-43°42'54"	21:53	23:17	00:40	detectable
NGC 6572	PNe	8.0	Oph	18h12m06.4s	+06°51'12"	21:07	23:21	03:12	obvious
M 16	Open	6.5	Ser	18h18m48.0s	-13°48'24"	21:17	23:28	01:55	obvious
M 17	Open	7.3	Sgr	18h20m47.0s	-16°10'18"	21:34	23:29	01:41	detectable
M 18	Open	7.5	Sgr	18h19m58.0s	-17°06'06"	21:22	23:29	01:35	easy
M 28	Glob	6.9	Sgr	18h24m33.0s	-24°52'12"	23:08	23:33	23:58	detectable
NGC 6633	Open	5.6	Oph	18h27m15.0s	+06°30'30"	21:20	23:36	03:25	easy
M 25	Open	6.2	Sgr	18h31m47.0s	-19°07'00"	21:50	23:40	01:32	detectable
M 22	Glob	5.2	Sgr	18h36m24.0s	-23°54'12"	22:53	23:44	00:36	detectable
IC 4756	Open	5.4	Ser	18h39m00.0s	+05°27'00"	21:25	23:47	03:20	easy
M 70	Glob	7.8	Sgr	18h43m13.0s	-32°17'30"	21:55	23:52	01:49	detectable
M 11	Open	6.1	Sct	18h51m05.0s	-06°16'12"	21:29	00:00	03:01	detectable
NGC 6716	Open	7.5	Sgr	18h54m34.0s	-19°54'06"	22:19	00:03	01:47	detectable
M 57	PNe	9.4	Lyr	18h53m35.1s	+33°01'45"	21:20	00:02	04:37	easy
M 54	Glob	7.7	Sgr	18h55m03.0s	-30°28'42"	22:15	00:03	01:51	detectable
NGC 6723	Glob	6.8	Sgr	18h59m33.0s	-36°37'54"	22:22	00:08	01:54	detectable
M 56	Glob	8.4	Lyr	19h16m36.0s	+30°11'06"	21:31	00:24	04:03	detectable
M 55	Glob	6.3	Sgr	19h40m00.0s	-30°57'42"	22:44	00:49	02:51	detectable
NGC 6818	PNe	10.0	Sgr	19h43m57.8s	-14°09'12"	22:27	00:52	03:17	easy
M 71	Glob	8.4	Sge	19h53m46.0s	+18°46'42"	21:28	01:02	04:37	easy
M 27	PNe	7.3	Vul	19h59m36.3s	+22°43'16"	21:29	01:08	04:39	easy
NGC 6871	Open	5.8	Cyg	20h05m59.0s	+35°46'36"	21:28	01:14	04:39	easy
NGC 6910	Open	7.3	Cyg	20h23m12.0s	+40°46'42"	21:28	01:31	04:43	easy
M 29	Open	7.5	Cyg	20h23m57.0s	+38°30'30"	21:29	01:32	04:42	easy
NGC 7009	PNe	8.3	Aqr	21h04m10.9s	-11°21'48"	23:30	02:12	04:54	obvious
M 15	Glob	6.3	Peg	21h29m58.0s	+12°10'00"	22:50	02:38	04:43	easy
M 39	Open	5.3	Cyg	21h31m48.0s	+48°26'00"	21:37	02:40	04:44	easy
M 2	Glob	6.6	Aqr	21h33m27.0s	-00°49'24"	23:20	02:42	04:43	detectable
M 30	Glob	6.9	Cap	21h40m22.0s	-23°10'42"	01:44	02:49	03:53	detectable
NGC 7160	Open	6.4	Cep	21h53m40.0s	+62°36'12"	21:23	02:57	04:49	obvious
NGC 7243	Open	6.7	Lac	22h15m08.0s	+49°53'54"	22:56	02:59	04:41	detectable
NGC 7293	PNe	6.3	Aqr	22h29m38.5s	-20°50'14"	02:02	03:39	04:44	detectable
M 52	Open	8.2	Cas	23h24m48.0s	+61°35'36"	00:00	04:01	04:39	detectable
NGC 7790	Open	7.2	Cas	23h58m24.0s	+61°12'30"	23:06	04:07	04:47	obvious
NGC 7789	Open	7.5	Cas	23h57m24.0s	+56°42'30"	00:49	04:07	04:39	detectable
NGC 637	Open	7.3	Cas	01h43m04.0s	+64°02'24"	00:42	04:08	04:48	obvious
NGC 559	Open	7.4	Cas	01h29m31.0s	+63°18'24"	00:31	04:08	04:46	easy
NGC 663	Open	6.4	Cas	01h46m09.0s	+61°14'06"	00:54	04:08	04:44	easy
M 103	Open	6.9	Cas	01h33m23.0s	+60°39'00"	00:42	04:08	04:48	obvious
NGC 457	Open	5.1	Cas	01h19m35.0s	+58°17'12"	00:35	04:08	04:46	obvious
M 110	Gal	8.9	And	00h40m22.3s	+41°41'09"	01:30	04:13	04:42	detectable
M 31	Gal	4.3	And	00h42m44.3s	+41°16'07"	00:49	04:13	04:46	easy
M 32	Gal	8.9	And	00h42m41.8s	+40°51'58"	00:52	04:13	04:46	easy
NGC 1027	Open	7.4	Cas	02h42m40.0s	+61°35'42"	02:02	04:14	04:38	detectable

ID	Cls	Mag	Con	RA 2000	Dec 2000	Begin	Best	End	Difficulty
NGC 957	Open	7.2	Per	02h33m21.0s	+57°33'36"	01:51	04:15	04:44	easy
NGC 884	Open	4.4	Per	02h22m18.0s	+57°08'12"	01:40	04:15	04:48	obvious
NGC 869	Open	4.3	Per	02h19m00.0s	+57°07'42"	01:38	04:14	04:47	obvious
M 76	PNe	10.1	Per	01h42m19.9s	+51°34'31"	01:48	04:14	04:41	detectable
M 34	Open	5.8	Per	02h42m05.0s	+42°45'42"	02:32	04:16	04:42	easy
NGC 752	Open	6.6	And	01h57m41.0s	+37°47'06"	03:26	04:16	04:33	challenging
NGC 1502	Open	4.1	Cam	04h07m50.0s	+62°19'54"	03:12	04:17	04:49	obvious
NGC 1444	Open	6.4	Per	03h49m25.0s	+52°39'30"	03:18	04:17	04:48	obvious
M 33	Gal	6.4	Tri	01h33m50.9s	+30°39'36"	02:12	04:16	04:42	detectable
NGC 1528	Open	6.4	Per	04h15m23.0s	+51°12'54"	03:47	04:18	04:41	easy
NGC 1342	Open	7.2	Per	03h31m38.0s	+37°22'36"	03:33	04:19	04:41	easy
M 45	Open	1.5	Tau	03h47m00.0s	+24°07'00"	04:18	04:22	04:46	obvious
NGC 253	Gal	7.9	Scl	00h47m33.1s	-25°17'20"	03:12	04:22	04:44	detectable
M 77	Gal	9.7	Cet	02h42m40.8s	-00°00'48"	04:21	04:24	04:42	detectable
NGC 288	Glob	8.1	Scl	00h52m45.0s	-26°35'00"	03:47	04:23	04:39	difficult
NGC 55	Gal	8.5	Scl	00h15m08.4s	-39°13'13"	03:49	04:26	04:42	difficult

Astrophoto of The Month

A glorious Milky Way up at Mt. Piños

By Shane Barker - 6/20/09 - Canon EOS DIGITAL REBEL - 439 seconds

A.V.A.C. Information

Membership in the Antelope Valley Astronomy Club is open to any individual or family.

The Club has three categories of membership.

- Family membership at $30.00 per year.
- Individual membership at $25.00 per year.
- Junior membership at $15.00 per year.

Membership entitles you to…

- Desert Sky Observer–monthly newsletter.
- The Reflector – the publication of the Astronomical League.
- The A.V.A.C. Membership Manual.
- To borrow club equipment, books, videos and other items.

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