ANTELOPE VALLEY ASTRONOMY CLUB, INC.

Desert Sky Observer

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

Up-Coming Events

May 8: Club Meeting*
May 11: Board Meeting
May 16: Moon Walk and Star Party @ Prime Desert Woodlands
May 22: RTMC

* 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

Spring is in the air, the sound of softly humming goto servos punctuates the warm, clear nights – at least it had better be warmer and clearer! Did I mention that Matt actually had to pull his motor home around to the windward side of the parking lot during our Messier Marathon in order to shield us die-hards from the prevailing winds! When I first came to this valley, back in '90, I saw a funny tee-shirt. It said, "Antelope Valley Wind Festival: Jan. 1, 1990 – Dec. 31, 1990" I'm not laughing now…

Seriously, you can tell when our star parties are by the forecast! It's gorgeous today but by this weekend – cooler and cloudy with rain on the way. Not to discourage anyone though – It should be a great time at Devil's Punchbowl with David Numer and staff co-hosting their Monthly Telescope night.

Of course May means RTMC – I just hope to have my scope finished by then (the mirror is being recoated as we speak or so they tell me). Start saving those pennies for as a wise man once said (I think Terry P. said it also…), you can't bring too much money to RTMC! For those of you who just can't make it up to Big Bear, the Basham's are planning a star party at their place – watch the website for more info.

Upcoming in June on the 20th, our Dark Sky Star Party will be held at Red Rock Canyon – not in one of those dusty campsites either but instead, at the visitor's center parking lot! Also in June (probably the 6th or 13th) we'll have a repair day. Anyone who wants to come out to my house and help clean and repair the club's scopes is welcome. More to follow but I anticipate swimming and bar-be-cueing.

July means warmer weather and warmer weather means Mt. Pinos! Arrive early and take the hike to the top. Stay all night and have breakfast at the Flying J (sorry Duane, no Crazy Otto's)! We may try to make it up there again in August – perhaps the 15th – but keep August 22nd free 'cause that's going to be another great club picnic at Mt. Trotta – What with swimming, Bar-be-cueing, silent auctions and raffles, I may even bring my entire telescope this year!

Finally, what better even to cap off the warmer months than our (getting to be) annual trek up to Mt. Wilson and an evening's observing through the 60" telescope. If you haven't signed up by now it may be too late but sign up for the waiting list with Karole or on the website – it's an experience not to be missed!

See you among the stars.

Vice President

Rose Moore

The warmer weather is almost upon us! Hooray! Now we all can look forward to events such as the upcoming Poppy Festival, RTMC, PDW, and star parties at Mt. Pinos and other sites! And don't forget our community outreach. What could be better than hearing a kid, or adult, at one of our telescopes saying 'WOW!!!!'

Our upcoming guest speakers at our club meetings include:

May: Gary Peterson of San Diego State University speaking on 'Exploring the Lunar Landscape'

July: Chris Butler speaking on 'Under The Southern Stars'

September: Doug Drake, club member and past club president, speaking on Cosmology

November: Jeremy Amarant and Matt Leone speaking on Messier Objects/Planetarium presentation

We still have June and August opened for speakers, and will hopefully fill those spots.

Our club picnic is coming up on August 22nd at Mt. Trotta. Please check the website for time and directions. We hope to see you all there for lots of fun, food, and visiting with fellow members and their families! If you would like to donate something for the silent auction or raffle, please contact me.

Clear skies to all!

Director of Community Development

Karole Barker

The turnout for Prime Desert Woodlands on April 18th was great. The sky was clear and and the weather was great, we had 97 people show up for the event and in addition we had 11 club members attend the event. The next Prime Desert Woodlands will be held on May 16th @ 8:30 p.m. We still need volunteers to bring out scopes that night. Please let me know if you can make it.

The Poppy Festival is coming up. This year's event is scheduled for April 25-26. Please specify on the signup sheet, which day you can assist at the booth.

On May 12th from 5:30 to 7:30 p.m. the Aero Institute in Palmdale is going to host "Family Night". There will be activities, exhibits, and NASA presentations. This event is free, but registration starts at 5:00 p.m. If you have any questions, please contact Deborah Rosenquist by phone 661-276-5603. Space is limited, so please reserve your place at this great event.

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, so if we had exactly 25 people going the cost per person would be $36.00. Right now the signup sheet is closed, since we are already at 25 signed up for the night. I will keep you posted.

One of our club big events is RTMC in Big Bear, which is going to be on May 22nd thru May 25th. There are a lot of vendors and great key note speakers every year at this event. It snowed on us last year. We can't wait to go again this year and see what happens.

Clear Skies.

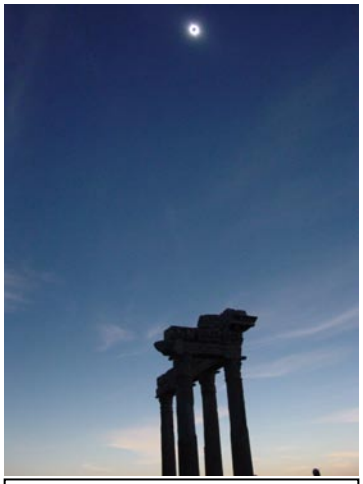
Sun Myths by Tom Koonce

The International Year of Astronomy theme during May is “Our Sun”

The closest star to the Earth has inspired awe, a sense of supreme power and acted as the first clock for mankind since the dawn of our existence. It was 1610 when the first telescopic observations were made of sunspots, it has only been within the last 400 years that we’ve been able to determine the Sun’s true nature. Rudimentary observations had been made millennia before this time, with the earliest recorded solar observation being made by the Babylonians of a solar eclipse on 5 May 1223 BC. The observation was written on a clay tablet uncovered in the ancient city of Ugarit, in what is now Syria. The spectacle of the Sun being covered by the face of the Moon was a phenomenon that occurred with some regularity and could be observed with the naked eye by early civilizations. Incomprehensible astronomical events such as these led to the creation of mythologies that sought to offer explanations of what was happening in the heavens. Interestingly, there are several similarities among the mythologies around the world even though cultural exchange between some of the societies hadn’t occurred.

Within Egyptian culture, the Sun-god “Re” was the creator. Re was portrayed as having a hawk’s head with a fiery red disk on top. Sometimes there was a cobra surrounding Re that symbolized how the Sun could bring death. Re had power over Osiris, ruler of the underworld. Light vanquished darkness. It was said that humans sprang forth from Re’s tears and that his children were the air and clouds, and his later descendants became the Earth and the stars, a mythological explanation of the belief that light brought life to the world.

Picture from the "Book of the Dead". One of the two figures with an orange disk is Re-Harakhti, the other may be Re. The other two figures are pharaohs.
Image courtesy James Wasserman,
The Egyptian Book of the Dead, Chronicle Books.



1995 Solar Eclipse above the Temple of Apollo in Turkey

In Greek and Roman mythology, Apollo was the son of Zeus (Jupiter) and Leto (Letona) and was the twin brother of the goddess Artemis. He was the god of the Sun, logic and reason. He was also a fine musician and healer. His most famous sacred place was at Delphi, site of the Oracle of Delphi. The Romans also believed Apollo was the god of light, music, and healing.

Leto travelled all over Greece to find a place to give birth to Apollo. She finally came upon an island named Delos. The island agreed to allow the birth of Apollo if he in turn founded a temple on the island. Leto agreed, and when Apollo grew up, he changed Delos into a beautiful island. Apollo was known as the god who could foretell the future.

The regular, predictable rising of the Sun each day instilled a faith in the future in most cultures. The Sun’s morning light swept back the darkness and fear of the night, shone onto crops giving life, and brought the joy of light and life, replacing the despair of evil spirits and death.

In West African lore, the Sun was a harsh, fierce entity called Liza who was inseparable from his twin sister Mawu, the Moon. Together they represented universal order and harmony. Liza resided in the east (where the Sun rises) and Mawu resided in the west (where the Moon’s phases begin). Liza was the god of

light, heat, work and strength. Mawu was the goddess of darkness, fertility, rest and motherhood. When there was an eclipse, it was said that Mawu and Liza were making love.

In very few mythologies, the Sun was portrayed as taking feminine form. For instance the oldest Japanese religion, Shinto, regards the Sun as a goddess named Amaterasu. When she was in her cave the darkness allowed evil, despair, grief and destruction to reign over the Earth, but when she was enticed to come out and the brilliant light of Amaterasu finally illuminated and colored the world.

These examples can be distilled down into common themes such as light triumphs over darkness, good triumphs over evil, the Sun represents supreme order in the universe, and it is the Sun which brings life to the Earth. We can see that the cultural mythologies were explanations for astronomical behaviors ancient peoples observed every day. We may have different explanations for these observations today, but underlying truths remain. Without the Sun, we would die. The Sun will rise tomorrow.

Three thousand years ago the Summerians' mythology named Shamash as a Sun god in Mesopotamia, between the valleys of Tigris and Euphrates rivers. Since he could see everything on Earth, he represented also the god of justice; the triumph of good over evil. It was said that every morning without fail, the scorpion-men of the East Mountain would open the gate and allow Shamash to come out. He was pulled across the sky in a chariot. At the end of the day, Shamash would enter the West Mountain, and begin his travel through the Underworld. The next day, he would begin yet another journey across the sky.

Symbol for Shamash, Ancient Summerian Sun God

References: http://www.san-julian.co.uk/solar_eclipse_2006.htm
http://www.windows.ucar.edu/tour/link=/mythology/planets/sun.html&edu=high

Clear Skies,
Tom

Miscellaneous

The Grand Canyon Star Party this year is from June 13th through the 20th. Jennifer and Bill Riedhart had planned to go and have a reservation at the Grand Canyon trailer village for June 13th through June 22. It turns out they won't be able to go after all. Before they cancel the reservation they thought someone in the Astronomy Club might want it. The site is $30 per night and has full hook-ups. It's a short walk to the south rim from the trailer park. If you are interested call Bill at 661-272-1069.

Question: How many astronomers does it take to change a light bulb?

- A: I thought astronomers used standard candles.
- A: Two: one to change the bulb, the other to complain about the light pollution.
- A: 10^8, because astronomers love really big numbers!
- A: None, they wouldn't change it because it ruins their night vision.
- A: What's a light bulb?

Space Place

The Swiss Army Knife of Weather Satellites

Spotting volcanic eruptions, monitoring the health of crops, pinpointing distress signals for search and rescue teams.

It's not what you might expect from a weather satellite. But these are just a few of the abilities of NOAA's newest polar-orbiting weather satellite, launched by NASA on February 6 and turned over to NOAA for full-time operations on February 26.

Formerly called NOAA-N Prime and now renamed NOAA-19, it is the last in its line of weather satellites that stretches back almost 50 years to the dawn of the Space Age. Over the decades, the abilities of these Television Infrared Observation Satellites (TIROS) have gradually improved and expanded, starting from the grainy, black-and-white images of Earth's cloud cover taken by TIROS-1 and culminating in NOAA-19's amazing array of capabilities.

"This TIROS series has become quite the Swiss army knife of weather satellites, and NOAA-19 is the most capable one yet," says Tom Wrublewski, NOAA-19 Satellite Acquisition Manager at NASA's Goddard Space Flight Center in Greenbelt, Maryland.

The evolution of TIROS began in 1998 with NOAA-K. The satellites have carried microwave sensors that can measure temperature variations as small as 1 degree Celsius between Earth's surface and an altitude of 40 kilometers—even through clouds. Other missions have added the ability to track large icebergs for cargo ships, monitor sea surface temperatures to aid climate change research, measure the amount of ozone in Earth's protective ozone layer, and even detect hazardous particles from solar flares that can affect communications and endanger satellites, astronauts in orbit, and city power grids.

NOAA-19 marks the end of the TIROS line, and for the next four years it will bridge the gap to a new series of satellites called the National Polar-orbiting Operational Environmental Satellite System. NPOESS will merge civilian and military weather satellites into a single system. Like NOAA-19, NPOESS satellites will orbit Earth from pole to pole, circling the planet roughly every 100 minutes and observing every location at least twice each day.

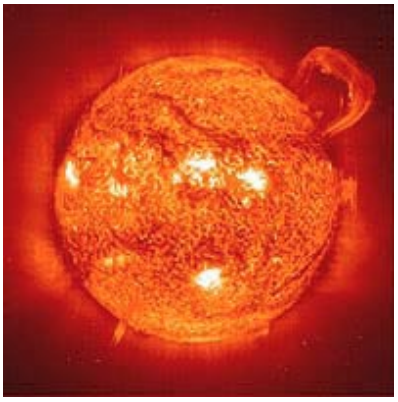
NPOESS will have yet more capabilities drawn from its military heritage. Dim-light sensors will improve observations of the Earth at night, and the satellites will better monitor winds over the ocean — important information for ships at sea and for weather and climate models.
"A lot more capability is going to come out of NPOESS, improving upon the 161 various environmental data products we already produce today," Wrublewski says.
Not even a Swiss army knife can do that many things, he points out.

For more on the NPOESS, check out http://www.npoess.noaa.gov. Kids can find out about another NOAA satellite capability—tracking endangered migrating species—and play a fun memory game at http://spaceplace.nasa.gov/en/kids/poes_tracking.

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

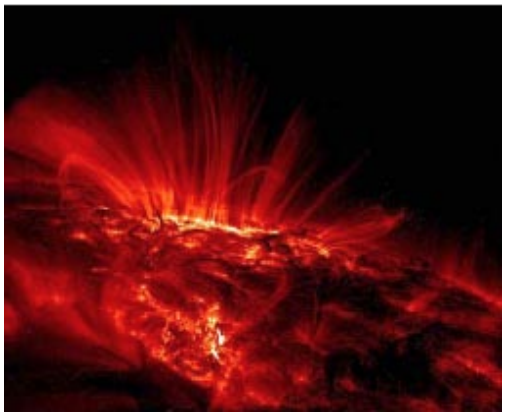
International Year of Astronomy

Our Sun



It warms the days, gives plants energy to grow, and allows us to see everything around us. In fact, without our Sun, we would not be here at all! Born from a cloud of gas and dust about 5 billion years ago, our Sun is a relatively quiet middle-aged star of average size in the suburbs of the Milky Way galaxy. But for Earthlings, the Sun couldn't be more special or fascinating. Credit NASA, ESA, SOHO

As normal as our Sun seems on paper, it's not such a tame place. It was once thought that the Sun and all of the objects in the night sky were stable, unchanging spheres. When Galileo observed the sun through a telescope, his observations turned that idea on its head. He was one of the first people to record sunspots using a telescope. Sunspots are dark, irregular areas on the surface of the Sun caused by changing magnetic fields. They appear and disappear over hours to months and can be larger in size than the whole Earth.



Even though it is far away, the Sun's influence is so powerful that eruptions can affect satellites and power grids here on Earth and cause the beautiful auroras. Scientists at NASA are busy learning about the Sun's activity using some hot new technology. The STEREO mission has sent two space probes into the Earth's orbit- one ahead and one behind. Just like our two eyes allow us to see in 3D, the two cameras give us a 3D picture of the Sun. The Hinode mission is showing a magnetic field even more act than previously thought. And the THEMIS mission is investigating how the solar wind powers auroras like the Northern Lights.

FAST FACTS

Spectral Type of Star	G2V
Age	4.6 billion years
Mean Distance to Earth	149.60 million km (92.96 million mi) (1 astronomical unit)
Rotation Period at Equator	26.8 days
Rotation Period at Poles	36 days
Equatorial Radius	695,500 km (432,200 mi)
Mass	1.989×10^{30} kg
Density	1.409 g/cm^3
Composition	92.1% hydrogen, 7.8% helium
Surface Temperature (Photosphere)	5,500 deg C (10,000 deg F)
Luminosity*	3.83×10^{30} ergs/sec

*Luminosity measures the total energy radiated by the Sun (or any star) per second at all wavelengths.

***It is very dangerous to observe the Sun directly. It can hurt your eyes and even cause blindness. Do not stare directly at the Sun or look at the Sun through a telescope without an approved solar filter. Find tips on safely observing the Sun here: http://www.spaceweather.com/sunspots/doityourself.html

News Headlines

Hidden Planet Discovered in Old Hubble Data
A new technique has uncovered an extrasolar planet hidden in Hubble Space Telescope images taken 11 years ago. The new strategy may allow researchers to uncover other distant alien worlds potentially lurking in over a decade's worth of Hubble archival data.
http://www.space.com/scienceastronomy/090401-hubble-exoplanets.html

NASA Searches for Solar System's Lost Planet
The solar system might once have had another planet named Theia, which may have helped create our own planet's moon. Now two spacecrafts are heading out to search for leftovers from this rumored sibling, which would have been destroyed when the solar system was still young.
http://www.foxnews.com/story/0,2933,515155,00.html

NASA's Space Shuttle Atlantis At Launch Pad For Hubble Mission
After safely reaching its launch pad at NASA's Kennedy Space Center in Florida, space shuttle Atlantis now awaits liftoff for its target May 12 STS-125 mission to the Hubble Space Telescope.
http://www.spaceref.com/news/viewpr.html?pid=27897

Most Distant Detection Of Water In The Universe
Astronomers have found the most distant signs of water in the Universe to date. The water vapour is thought to be contained in a jet ejected from a supermassive black hole at the centre of a galaxy, named MG J0414+0534
http://www.sciencedaily.com/releases/2009/04/090422085756.htm

Time For A New Theory Of Gravitation?
The high speed of stars and apparent presence of ‘dark matter’ in the satellite galaxies that orbit our Milky Way Galaxy presents a direct challenge to Newton’s theory of gravitation, according to physicists from Germany, Austria and Australia.
http://www.sciencedaily.com/releases/2009/04/090422085830.htm

Mars rover Spirit suffers another round of glitches
NASA's five-year-old Spirit Mars rover suffered another round of glitches on Friday and Saturday after three days of behaving normally, NASA reports. Engineers are trying to investigate the source of the problems, which have plagued the rover in recent weeks.
http://www.newscientist.com/article/dn16998-mars-rover-spirit-suffers-another-round-of-glitches.html

JPL Invites Public to Annual Open House
NASA's Jet Propulsion Laboratory, Pasadena, Calif., welcomes the public to its annual Open House on Saturday, May 2, and Sunday, May 3, from 9 a.m. to 5 p.m. The lab will salute the 40th anniversary of NASA's Apollo 11 mission – the first human landing on the moon. JPL will also celebrate the International Year of Astronomy, a United Nations-endorsed series of events around the world that commemorate the 400th anniversary of the first telescope observations of space and planets by Italian scientist Galileo Galilei.
http://www.jpl.nasa.gov/news/news.cfm?release=2009-070a

Astrophoto of The Month

Mars

C14, 2X Barlow, Philips ToUcam Pro, IR filter, 500 images stacked and processed with RegiStax
Taken 10-24-05 by Bill Riedhart

For Sale

8" Orion Schmitt-Cassegrain on an equatorial mount with soft case. Used only once. Paid over $1000. Will accept best offer $800-$900, it's a sacrifice. No filters or eyepieces.
For more information, contact Chuck Tedeschi at ctedeschi@sbcglobal.net

10” Meade LXD55 Schmidt-Newtonian Telescope w/ Meade Autostar, Series 4000 Eyepiece & Filter Set, 47"x17"x18" Orion Padded Telescope Case, Astrozap Flexible Dew Shield, Kendrick Astro Instruments Solar Filter, Sacimaging SAC7 Camera & Mount. I am asking $1750.00, for everything, OBO.
Contact David Jones 661-242-2757 mdavidejones@hughes.net

May Sky Data

Best time for deep sky observing this month:
May 16 through May 25

Mercury is at inferior conjunction (almost directly in front of the Sun) on May 18th. We may just be able to glimpse it after sunset, at the very start of May, but it will soon disappear, and we won't see it again this month

Venus is rising an hour or so before the Sun, and we may be able to see the brilliant "Morning Star" very low in the east at dawn. Don't confuse it with Jupiter, which is about 45 degrees further right and somewhat higher up; Venus is really much brighter than Jupiter, but it will be more dimmed by the atmosphere, so the two planets may appear quite similar.

Mars is also in the morning sky, coming up in the east a few minutes after Venus. But the Red Planet is very much fainter than Venus, and will be virtually impossible to observe this month.

Jupiter is rising in the south-east in the early hours of the morning and it's well up in the southeastern sky at dawn. Relative to the stars, Jupiter is moving slowly north-eastwards in Capricornus. If you're familiar with the three bright stars of the "Summer Triangle", you will find Jupiter far below them. Although it's so low down, Jupiter should still outshine any of the real stars.

Saturn is well up in the south-western sky at dusk, and doesn't set until dawn. Relative to the stars it is virtually stationary this month, at the eastern end of the constellation of Leo, well to the left of the bright star Regulus. Saturn appears brighter than Regulus, and it shines with a steady, untwinkling light, slightly more creamy in colour than the blue-white star.

On any clear night, we may see the occasional **meteor** or "shooting-star", as tiny specks of interplanetary débris burn up in the Earth's atmosphere. At certain times of the year, the Earth travels through a cloud of this dust, and we get a meteor-shower. However, there are no significant meteor-showers for northern-hemisphere observers in May.

Sun and Moon Rise and Set

Date	Moonrise	Moonset	Sunrise	Sunset
5/1/2009	12:16	01:36	06:01	19:37
5/5/2009	16:36	03:41	05:57	19:40
5/10/2009	21:43	06:33	05:52	19:44
5/15/2009	00:36	11:06	05:48	19:48
5/20/2009	02:55	16:03	05:45	19:52
5/25/2009	06:30	21:49	05:42	19:55
5/31/2009	13:28	01:16	05:40	19:59

Planet Data

May 1

	Rise	Transit	Set	Mag
Mercury	06:45	14:03	21:19	1.3
Venus	04:04	10:18	16:34	-4.5
Mars	04:26	10:39	16:53	1.2
Jupiter	02:28	07:55	13:27	-2.3
Saturn	14:50	21:19	03:48	0.7

May 15

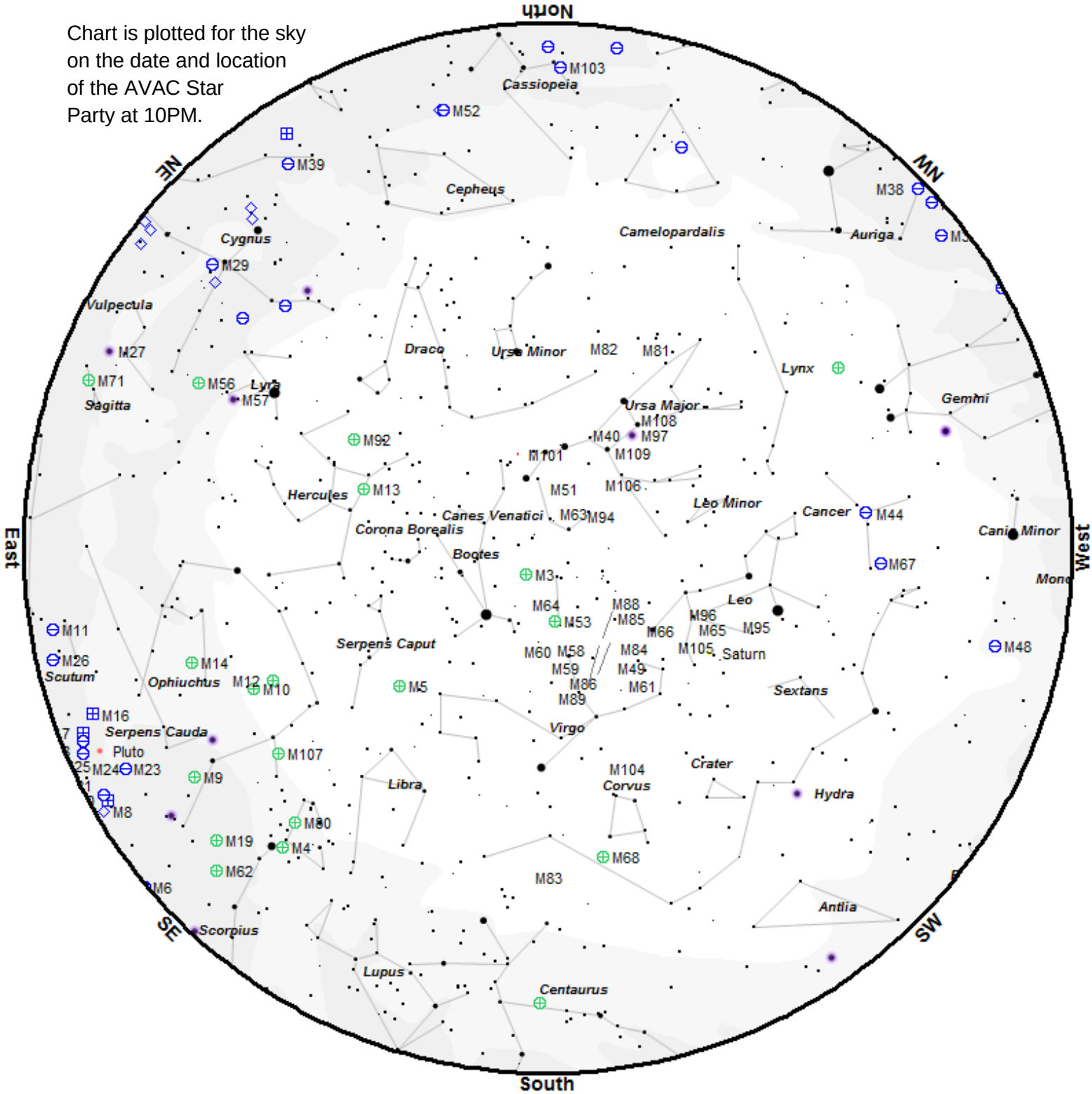
	Rise	Transit	Set	Mag
Mercury	05:55	13:04	20:08	5.1
Venus	03:40	09:59	16:18	-4.5
Mars	03:58	10:23	16:49	1.2
Jupiter	01:37	07:06	12:39	-2.4
Saturn	13:54	20:23	02:53	0.8

May 31

	Rise	Transit	Set	Mag
Mercury	04:47	11:36	18:29	2.0
Venus	03:18	09:48	16:18	-4.3
Mars	03:28	10:06	16:44	1.2
Jupiter	00:38	06:08	11:38	-2.5
Saturn	12:52	19:21	01:50	0.9

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
NGC 3242	PNe	8.6	Hya	10h24m46.1s	-18°38'32"	20:53	21:20	22:56	obvious
M 67	Open	7.4	Cnc	08h51m18.0s	+11°48'00"	21:06	21:22	21:38	detectable
M 44	Open	3.9	Cnc	08h40m24.0s	+19°40'00"	21:04	21:23	21:47	easy
NGC 3227	Gal	11.5	Leo	10h23m30.6s	+19°51'54"	21:05	21:27	22:46	difficult
M 65	Gal	10.1	Leo	11h18m55.7s	+13°05'32"	21:02	21:29	23:40	detectable
M 66	Gal	9.7	Leo	11h20m14.9s	+12°59'30"	21:01	21:30	23:44	detectable
M 82	Gal	9.0	UMa	09h55m52.4s	+69°40'47"	21:03	21:34	00:58	easy
M 81	Gal	7.8	UMa	09h55m33.1s	+69°03'56"	21:03	21:34	00:54	detectable
M 97	PNe	11.0	UMa	11h14m47.7s	+55°01'09"	21:11	21:35	23:09	challenging
M 68	Glob	7.3	Hya	12h39m28.0s	-26°44'36"	21:02	21:35	23:34	detectable
M 86	Gal	9.8	Vir	12h26m12.2s	+12°56'44"	21:04	21:37	00:17	detectable
M 84	Gal	10.1	Vir	12h25m03.9s	+12°53'12"	21:01	21:36	00:31	detectable
M 87	Gal	9.6	Vir	12h30m49.2s	+12°23'29"	21:01	21:37	00:38	detectable
M 49	Gal	9.3	Vir	12h29m46.8s	+08°00'01"	21:02	21:37	00:34	detectable
M 104	Gal	9.1	Vir	12h39m59.3s	-11°37'22"	21:01	21:38	00:03	detectable
M 106	Gal	9.1	CVn	12h18m57.6s	+47°18'13"	21:02	21:39	01:14	detectable
NGC 4565	Gal	10.1	Com	12h36m20.8s	+25°59'15"	21:03	21:40	00:37	difficult
M 94	Gal	8.7	CVn	12h50m53.1s	+41°07'12"	20:59	21:45	02:05	easy
M 64	Gal	9.3	Com	12h56m43.8s	+21°41'00"	21:01	21:45	01:27	detectable
NGC 5128	Gal	7.8	Cen	13h25m27.7s	-43°01'07"	21:18	22:05	22:59	difficult
NGC 5139	Glob	3.9	Cen	13h26m46.0s	-47°28'36"	21:07	22:07	23:21	detectable
NGC 5195	Gal	10.5	CVn	13h29m59.6s	+47°15'58"	21:04	22:10	02:17	detectable
M 51	Gal	8.7	CVn	13h29m52.3s	+47°11'40"	21:01	22:10	03:00	easy
M 83	Gal	7.8	Hya	13h37m00.8s	-29°51'56"	21:00	22:16	00:32	detectable
M 3	Glob	6.3	CVn	13h42m11.0s	+28°22'42"	21:00	22:22	02:32	easy
M 101	Gal	8.4	UMa	14h03m12.4s	+54°20'53"	21:06	22:39	02:51	detectable
NGC 5897	Glob	8.4	Lib	15h17m24.0s	-21°00'36"	22:18	23:57	01:35	difficult
M 5	Glob	5.7	Ser	15h18m34.0s	+02°05'00"	21:05	23:58	03:29	easy
NGC 5986	Glob	7.6	Lup	15h46m03.0s	-37°47'12"	22:55	00:26	01:57	detectable
M 80	Glob	7.3	Sco	16h17m02.0s	-22°58'30"	23:40	00:56	02:12	detectable
NGC 6124	Open	6.3	Sco	16h25m20.0s	-40°39'12"	00:08	01:05	02:02	difficult
NGC 6178	Open	7.2	Sco	16h35m47.0s	-45°38'36"	23:27	01:15	03:03	easy
NGC 6193	Open	5.4	Ara	16h41m20.0s	-48°45'48"	23:55	01:21	02:46	easy
M 13	Glob	5.8	Her	16h41m41.0s	+36°27'36"	21:11	01:21	04:24	easy
M 12	Glob	6.1	Oph	16h47m14.0s	-01°56'48"	22:03	01:26	04:22	easy
M 10	Glob	6.6	Oph	16h57m09.0s	-04°06'00"	22:36	01:37	04:17	detectable
M 62	Glob	6.4	Oph	17h01m13.0s	-30°06'48"	23:29	01:41	03:53	detectable
M 19	Glob	6.8	Oph	17h02m38.0s	-26°16'06"	23:32	01:42	03:50	detectable
M 92	Glob	6.5	Her	17h17m07.0s	+43°08'12"	21:19	01:56	04:25	easy
NGC 6322	Open	6.5	Sco	17h18m25.0s	-42°56'00"	23:53	01:58	04:01	easy
M 9	Glob	7.8	Oph	17h19m12.0s	-18°31'00"	23:59	01:58	03:58	detectable
NGC 6383	Open	5.4	Sco	17h34m48.0s	-32°34'00"	23:50	02:14	04:22	easy

ID	Cls	Mag	Con	RA 2000	Dec 2000	Begin	Best	End	Difficulty
M 14	Glob	7.6	Oph	17h37m36.0s	-03°14'48"	23:16	02:17	04:21	detectable
NGC 6388	Glob	6.8	Sco	17h36m17.0s	-44°44'06"	00:54	02:16	03:38	detectable
M 6	Open	4.6	Sco	17h40m20.0s	-32°15'12"	23:43	02:20	04:26	easy
IC 4665	Open	5.3	Oph	17h46m18.0s	+05°43'00"	23:17	02:25	04:23	detectable
NGC 6543	PNe	8.3	Dra	17h58m33.4s	+66°37'59"	20:55	02:33	04:38	obvious
M 7	Open	3.3	Sco	17h53m51.0s	-34°47'36"	00:23	02:33	04:23	easy
M 23	Open	5.9	Sgr	17h57m04.0s	-18°59'06"	00:41	02:36	04:24	detectable
M 20	Open	5.2	Sgr	18h02m42.0s	-22°58'18"	01:26	02:42	03:58	easy
M 21	Open	7.2	Sgr	18h04m13.0s	-22°29'24"	01:22	02:43	04:05	detectable
M 8	Neb	5.0	Sgr	18h04m02.0s	-24°23'14"	01:50	02:44	03:37	easy
NGC 6541	Glob	6.3	CrA	18h08m02.0s	-43°42'54"	01:33	02:47	04:01	detectable
NGC 6572	PNe	8.0	Oph	18h12m06.4s	+06°51'12"	23:00	02:51	04:43	obvious
M 18	Open	7.5	Sgr	18h19m58.0s	-17°06'06"	00:49	02:59	04:30	easy
M 16	Open	6.5	Ser	18h18m48.0s	-13°48'24"	00:27	02:58	04:33	obvious
M 17	Open	7.3	Sgr	18h20m47.0s	-16°10'18"	00:46	03:00	04:20	detectable
M 28	Glob	6.9	Sgr	18h24m33.0s	-24°52'12"	02:20	03:04	03:48	detectable
NGC 6633	Open	5.6	Oph	18h27m15.0s	+06°30'30"	23:15	03:06	04:30	easy
M 25	Open	6.2	Sgr	18h31m47.0s	-19°07'00"	01:16	03:11	04:25	detectable
M 22	Glob	5.2	Sgr	18h36m24.0s	-23°54'12"	02:12	03:15	04:18	detectable
IC 4756	Open	5.4	Ser	18h39m00.0s	+05°27'00"	23:45	03:18	04:26	easy
M 70	Glob	7.8	Sgr	18h43m13.0s	-32°17'30"	01:27	03:22	04:25	detectable
M 57	PNe	9.4	Lyr	18h53m35.1s	+33°01'45"	22:38	03:30	04:31	easy
M 11	Open	6.1	Sct	18h51m05.0s	-06°16'12"	00:29	03:29	04:27	detectable
NGC 6716	Open	7.5	Sgr	18h54m34.0s	-19°54'06"	01:44	03:32	04:27	detectable
M 54	Glob	7.7	Sgr	18h55m03.0s	-30°28'42"	01:47	03:33	04:21	detectable
NGC 6723	Glob	6.8	Sgr	18h59m33.0s	-36°37'54"	01:56	03:38	04:26	detectable
M 56	Glob	8.4	Lyr	19h16m36.0s	+30°11'06"	00:18	03:43	04:25	detectable
NGC 7160	Open	6.4	Cep	21h53m40.0s	+62°36'12"	00:34	03:53	04:30	obvious
NGC 6910	Open	7.3	Cyg	20h23m12.0s	+40°46'42"	00:07	03:53	04:28	easy
M 29	Open	7.5	Cyg	20h23m57.0s	+38°30'30"	00:19	03:53	04:28	easy
NGC 6871	Open	5.8	Cyg	20h05m59.0s	+35°46'36"	00:11	03:53	04:27	easy
M 27	PNe	7.3	Vul	19h59m36.3s	+22°43'16"	00:24	03:53	04:30	easy
M 71	Glob	8.4	Sge	19h53m46.0s	+18°46'42"	00:23	03:52	04:29	easy
M 52	Open	8.2	Cas	23h24m48.0s	+61°35'36"	02:26	03:57	04:18	detectable
M 39	Open	5.3	Cyg	21h31m48.0s	+48°26'00"	00:44	03:56	04:27	easy
NGC 6818	PNe	10.0	Sgr	19h43m57.8s	-14°09'12"	01:54	03:55	04:36	easy
NGC 7790	Open	7.2	Cas	23h58m24.0s	+61°12'30"	02:42	03:58	04:27	obvious
NGC 7243	Open	6.7	Lac	22h15m08.0s	+49°53'54"	01:55	03:57	04:23	detectable
M 55	Glob	6.3	Sgr	19h40m00.0s	-30°57'42"	02:15	03:57	04:26	detectable
NGC 7789	Open	7.5	Cas	23h57m24.0s	+56°42'30"	02:56	03:58	04:18	detectable
NGC 559	Open	7.4	Cas	01h29m31.0s	+63°18'24"	01:55	04:00	04:25	easy
NGC 457	Open	5.1	Cas	01h19m35.0s	+58°17'12"	02:14	04:00	04:25	obvious
M 15	Glob	6.3	Peg	21h29m58.0s	+12°10'00"	02:05	04:00	04:27	easy
M 2	Glob	6.6	Aqr	21h33m27.0s	-00°49'24"	02:44	04:02	04:26	detectable
M 110	Gal	8.9	And	00h40m22.3s	+41°41'09"	03:25	04:04	04:20	detectable
M 31	Gal	4.3	And	00h42m44.3s	+41°16'07"	03:08	04:03	04:23	easy
M 32	Gal	8.9	And	00h42m41.8s	+40°51'58"	03:08	04:04	04:23	easy
NGC 7009	PNe	8.3	Aqr	21h04m10.9s	-11°21'48"	02:59	04:04	04:39	obvious
M 30	Glob	6.9	Cap	21h40m22.0s	-23°10'42"	03:15	04:08	04:26	detectable

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

The Club has three categories of membership.

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- Individual membership at $25.00 per year.
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