



Desert Sky Observer

Volume 30

Antelope Valley Astronomy Club Newsletter

April 2010

Up-Coming Events

- April 3:** Moon Walk @ [Prime Desert Woodlands](#)
- April 9:** Club Meeting*
- April 10:** Guide to the [Night Sky Star Party](#)
- April 12:** Executive Board Meeting
- April 17:** Star Party @ [Red Cliffs](#)
- April 24-25:** Poppy Festival

* 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

Happy Spring! It seems our cold and cloudy star parties may be over as the last event at Saddleback Butte was perfect weather. I cooked burgers but forgot to bring the buns. Frank said to use some of the KFC biscuits that they had brought. Shane declared that it was delicious so next time it'll be biscuit burgers for all!

Some members had been talking about arranging a trip to a more remote dark sky site and the opportunity has arisen. A Y-princesses (YMCA) group from San Diego has invited us to participate in a star party at Joshua Tree National Park on Saturday, April 10th. A few of us have already committed to ride up Saturday morning to the Indian Cove group campground on the north side of the park. The area has a number of hiking and biking trails as well as very dark and clear skies. We would set up and invite the Y-Princesses to view the night sky as part of their astronomy requirements. Please let me if you would like to attend but there should be room enough for anyone who wants to attend.

The annual Riverside Telescope Maker's Conference (RTMC) is a star safari of sorts as well. A number of members will be heading up to Big Bear and Camp Oakes between the 12th through the 16th of May. The vendors, swap meet and raffles will be on Friday the 14th through Sunday the 16th but folks may show up as early as noon on Wednesday the 12th to take advantage of the dark skies. We will once again have a group of campers in attendance so look for the signup sheet or sign up on line. It's not required, but this way we'll know who to look for. For RTMC, though, you do need to sign up at rtmcastronomyexpo.org/general.html to attend (although it's usually no problem paying at the).

After RTMC in May we will look toward Mt. Pinos dark sky weekends. We hope to have star parties up there each new moon weekend from June till August and maybe even the first week in September if the weather's nice. And don't forget about our other summer activities such as the Mt. Wilson tour (sign up now!), the club picnic and the trip to Mt. Palomar Observatory. All in all it should be a very active and fun-filled spring and summer with the AVAC!



Vice President

Doug Drake

For our next meeting, April 9, I have invited Scott Lever from JPL, NASA, to give a presentation on, "Roaming Mars and a Personal Perspective." His talk will include uplink operations commanding the Mars rovers, an eight minute launch sequence and a landing simulation movie. Think of working with remote robots on Mars and finding scientific results, wow! This should be very exciting; I just wish I was going to be there. What I'm not going to be there at the meeting? That's right; I'm not going to be at the meeting because I am flying my Mooney up to Spokane Washington to visit my sister and will return during the week of April 11. I shall miss all of you, but hope you enjoy Scott Lever's presentation on Mars.



Director of Community Development

Rose Moore

Many thanks to those who helped out with the recent Girl Scout Star Party at Saddleback! There was a good turnout and lots of family as well as the scouts, and we also had clear skies, though a bright crescent moon.

Upcoming is a Prime Desert Moon Walk with Jeremy on Saturday, April 3rd at 8pm. Please come out with telescopes or anything else astronomical you would like to share with the public.

On Saturday April 10th, at Joshua Tree Indian Cove Campground, is a Star Party for the YMCA Indian Princesses. If you are interested in helping out, and doing a 'Star Safari', please contact Don Bryden.

On April 17th, Saturday, is a Lunar Club event and a Club Star Party, at a site TBA soon. Please check the website for more information.

Saturday and Sunday, April 24th and 25th, is the annual Poppy Festival at Lancaster City Park. Please come out, even for just a few hours either day, and support the club. You can bring telescopes, or something astronomy related, to show the public; or just talk to the public and pass the handouts to the visitors coming to our booth! Please sign up at our next meeting, or contact me or Don Bryden.

Don't forget our May club meeting is being held on Friday May 7th at 7pm, NOT on May 14th.

For May we have a Prime Desert Moon Walk with Jeremy on Saturday, May 8th at 8:30pm. Please come out to support Jeremy and our club in this public outreach event. Also for May is RTMC at Big Bear for those interested in attending. You can go to their [website](#) and sign up.

There are still openings for members interested in attending the Mt. Wilson trip on Saturday, August 7th. Please sign up at a meeting, or contact me.

Clear skies,
Rose

Spectacular Spiral by Tom Koonce

Every year around mid-April the Whirlpool galaxy is well placed for observation in the northern sky in Canes Venatici (The Hunting Dogs). The Whirlpool is also known as M51 and NGC 5194, but most people know it by the nickname that is obvious after your first view. It has a smaller, yellowish companion galaxy, NGC 5195 in the distance. The Whirlpool is the best spiral galaxy in the sky, in my opinion. It can be seen with a small telescope, the spiral arms detected in an 8" scope, and when it is viewed through a really large telescope it is a stunning sight that you'll never forget. It's always a star party favorite when it's visible higher in the sky. A friend once let me observed it through his 51" reflector and I could hardly tear myself away from the view after 15 minutes. I thought I had only been at the eyepiece for 30 seconds...



Photo Credit: HST, ACS

You will find it quickly by following the curved handle of the Big Dipper away from the dipper to the star Alkaid at the end of the handle. Then look 2 degrees (outer ring of your Telrad) lower to the south and west in declination at about a 90 degree angle to the handle of the dipper. Scan around the area at low powers and you'll spot it as a fuzzy patch of gray.

The more magnification that you apply to the view, the more of the galaxy's structure will be revealed. Under clear, dark skies you will easily be able to make out the spiral structure of the two tightly wound spiral arms, dust lanes and the illusion of a connecting bridge of material between the two galaxies that is not actually there, at least to the extent that it looks like through the eyepiece. The two galaxies interacted about 70 million years ago, with M51 coming out the winner, gaining mass and kick starting many regions of active star formation. While it certainly would have been an exciting (bad?) time to be living in the Whirlpool galaxy, the result today is a spectacular face-on spiral galaxy just 31 million light years away from us with plenty of interesting details, such as the pinkish knots of star forming regions and the radial

wisps of interactions between the spiral arms. At medium power, sharp observers may be able to spot another much smaller edge-on galaxy, NGC 5229, to the northwest in the same field of view.

There are a few tricks to observing the Whirlpool galaxy and other 'faint fuzzies' like it. Obviously clear, dark skies and steady seeing are important. Filters will not enhance your views of galaxies, since galaxies are composed of stars emitting at all frequencies, filtering the view down to a particular band of frequencies will not increase the contrast of the view, like looking at the Ring Nebula with an OIII filter. The best way to visually observe extended, dim, magnitude 8.4 objects like the Whirlpool is to increase the amount of light getting to your eye... thus "bigger aperture is better." Please be careful when viewing awesome deep sky objects like M51 through really big telescopes, as it has been known to lead to serious infections of "Aperture Fever" in some observers. Sadly, there is no known cure for it and no known health insurance plans cover the cost of treatment. Trips to the Texas Star Party, Winter Star Party and other major deep sky events where big telescopes are present only offer temporary relief.

Now that the weather is warming up once again, take some time in April to get to know the spectacular Whirlpool galaxy, either for the first time or perhaps visit your old friend and study it in new detail.

Clear Skies,
Tom

For More Information:

<http://hubblesite.org/newscenter/archive/releases/2005/12/image/a>
<http://apod.nasa.gov/apod/ap090526.html>

Aerospace Committee Report Jeff Riechmann and Roswell (co-chairbeings)

Vandenberg Launch Schedule: As of 2010 March 15

Date	Launch Time/Window (PST/PDT)	Vehicle	Pad/Silo
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APR 20	Unknown	Minotaur IV	SLC-8
First-ever Minotaur IV launch. Payload is believed to be the Technology Vehicle-2 (HTV-2). A source reports the unpowered HTV-2 will be launched on a booster rocket from Vandenberg AFB and glide to a target site in the Marshall Islands,			
JUN	To be announced	Minuteman III	---
Vehicle will probably send one or more unarmed warheads on a ballistic trajectory to the central Pacific			
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JEFF'S REPORT:

More Congested: Today, the US military's global network of terrestrial-based radar and optical sensors keeps tab on approximately 21,500 objects orbiting the Earth, an increase of 1,700 items compared to this time last year, Lt. Gen. Larry James, 14th Air Force commander, told the Senate Armed Services Committee Wednesday. Of these, there are nearly 10,000 pieces of debris, 6,800 unknown objects, 3,700 dead satellites and rocket pieces, and more than 1,100 active satellites. The Air Force is now able to keep track of all active satellites, predict when pieces of debris or satellites will re-enter the atmosphere, recommend when to safely launch a new payload, and prevent potential satellite collisions. In fact, Gen. Robert Kehler, Air Force Space Command boss, told these lawmakers that "there have already been 56 instances" where satellite owners maneuvered their spacecraft to avoid possible collisions based on USAF information. (Air Force Association's Daily Report)

Extraterrestrial Tidbits (ET) by Jeff Riechmann

Soyuz 10

April marks a couple of significant dates in the history of the Long Duration Orbiting Station, known by the Russian acronym DOS. It was named Salyut as a "salute" to Yuri Gagarin's historic first space flight. Salyut 1 was launched on 19 April 1971 and achieved orbit some 164 miles over the earth. With the station deployed successfully, the next step was to staff it. This was accomplished with the launch of Soyuz 10 on 23 April 1971 with cosmonauts Vladimir Shatalov, Alexei Yeliseyev and Nikolai Rukavishnikov. Later in the day, Soyuz 10 attempted to dock with the space station but the docking system would not fully engage and Soyuz 10 would be forced to return to earth on 24 April 1971. Later investigation revealed that the malfunction was the result with the docking system on the spacecraft, not on the space station. The next mission would be Soyuz 11, which will be discussed in the June edition of E.T.

Space Place

Deadly Planets

By Patrick L. Barry and Dr. Tony Phillips

About 900 light years from here is a rocky planet not much bigger than Earth. It goes around its star once every hundred days, a trifle fast, but not too different from a standard Earth-year. At least two and possibly three other planets circle the same star, forming a complete solar system.

Interested? Don't be. Going there would be the last thing you ever do.

The star is a pulsar, PSR 1257+12, the seething-hot core of a supernova that exploded millions of years ago. Its planets are bathed not in gentle, life-giving sunshine but instead a blistering torrent of X-rays and high-energy particles.

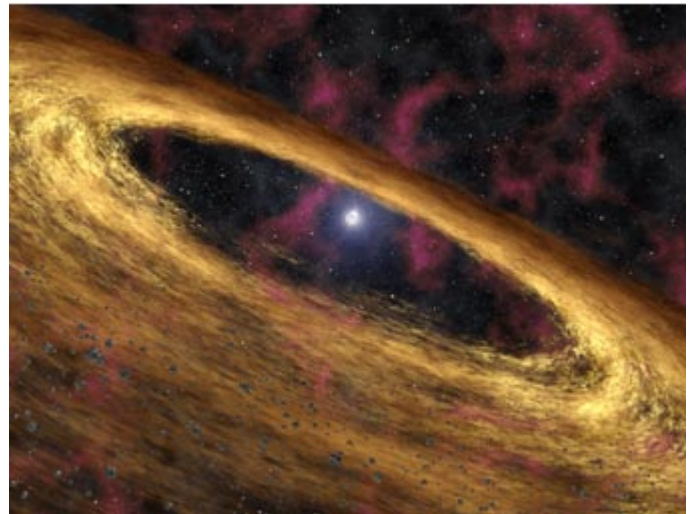
"It would be like trying to live next to Chernobyl," says Charles Beichman, a scientist at JPL and director of the Michelson Science Center at Caltech.

Our own Sun emits small amounts of pulsar-like X-rays and high energy particles, but the amount of such radiation coming from a pulsar is "orders of magnitude more," he says. Even for a planet orbiting as far out as the Earth, this radiation could blow away the planet's atmosphere, and even vaporize sand right off the planet's surface.

Astronomer Alex Wolszczan discovered planets around PSR 1257+12 in the 1990s using Puerto Rico's giant Arecibo radio telescope. At first, no one believed worlds could form around pulsars—it was too bizarre. Supernovas were supposed to destroy planets, not create them. Where did these worlds come from?

NASA's Spitzer Space Telescope may have found the solution. In 2005, a group of astronomers led by Deepto Chakrabarty of MIT pointed the infrared telescope toward pulsar 4U 0142+61. Data revealed a disk of gas and dust surrounding the central star, probably wreckage from the supernova. It was just the sort of disk that could coalesce to form planets!

As deadly as pulsar planets are, they might also be hauntingly beautiful. The vaporized matter rising from the planets' surfaces could be ionized by the incoming radiation, creating colorful auroras across the sky. And though the pulsar would only appear as a tiny dot in the sky (the pulsar itself is only 20-40 km across), it would be enshrouded in a hazy glow of light emitted by radiation particles as they curve in the pulsar's strong magnetic field.



Artist's concept of a pulsar and surrounding disk of rubble called a "fallback" disk, out of which new planets could form.

Wasted beauty? Maybe. Beichman points out the positive: "It's an awful place to try and form planets, but if you can do it there, you can do it anywhere."

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

News Headlines

Center for Meteorite Studies

The Center for Meteorite Studies invites you to enjoy some new video content on our website! <http://meteorites.asu.edu/research> hosts a video detailing the wide variety of research undertaken in the Center and <http://meteorites.asu.edu/collection> hosts a video describing the collection and the curation efforts that support it. We also started our own [YouTube channel](#) to showcase these videos and content that we develop in the future.

Atom-Smasher One Collision Closer to Understanding Matter

By crashing two proton beams together at more force than ever before, the Large Hadron Collider begins its bid to learn details about the fundamentals of space and matter.

<http://news.discovery.com/space/large-hadron-collider-collision.html>

Alien planet hunter develops a blind spot

Our best eye on alien worlds has developed a blind spot. NASA's planet-hunting telescope Kepler has developed a fault that means it sees the equivalent of static in some parts of its view.

<http://www.newscientist.com/article/dn18718-alien-planet-hunter-develops-a-blind-spot.html>

Black holes in the universe gain weight and light up during galaxy collisions

Giant black holes in the centers of galaxies grow mainly as a result of intergalactic collisions, according to results presented by a group of astronomers led by Ezequiel Treister from the University of Hawaii.

<http://www.astronomy.com/asy/default.aspx?c=a&id=9705>

Scientists Discover 'Catastrophic Event' Behind the Halt of Star Birth in Early Galaxy Formation

Scientists have found evidence of a catastrophic event they believe was responsible for halting the birth of stars in a galaxy in the early Universe. The researchers, led by Durham University's Department of Physics, observed the massive galaxy as it would have appeared just three billion years after the Big Bang when the Universe was a quarter of its present age.

<http://www.sciencedaily.com/releases/2010/03/100309202933.htm>

Map of Jupiter's red spot interior created

NASA says new thermal images from powerful Earth-based telescopes have produced the first detailed interior map of Jupiter's Great Red Spot. The space agency says the images show swirls of warmer air and cooler regions never seen before within the Great Red Spot, revealing the reddest color corresponds to a warm core within the otherwise cold storm system.

<http://www.skyandtelescope.com/news/wires?id=142569759&c=y>

Amateur Astronomer Catches Comet Breakup

If you've ever attended a star party where amateur astronomers set up telescopes to peruse stars and nebulae, you'll come away with a notion that the heavens look pretty sedate. But an amateur astronomer wound up looking at the right place at the right time to capture the breakup of a comet. The International Astronomical Union have even called the observation a "major astronomical discovery."

<http://news.discovery.com/space/amateur-astronomer-catches-comet-breakup.html>

April Sky Data

Best time for deep sky observing this month:
April 4 through April 17

Mercury is at its greatest elongation east of the Sun on April 8th. Any evening during the first week of April, try looking out to the west about 9 pm. The very bright planet Venus should be obvious. Mercury will be to the right of Venus, about three degrees away. Mercury is much fainter than Venus, but it should still be visible with the naked eye.

Venus is now becoming easy to see, low in the west after sunset; it doesn't set until at least two hours after the Sun. The "Evening Star" is so brilliant, it can be seen even against a bright twilight sky. This month Venus appears like the Moon shortly before Full, though since the disc of Venus is only 11 arc-seconds across, the phase won't be easy to detect.

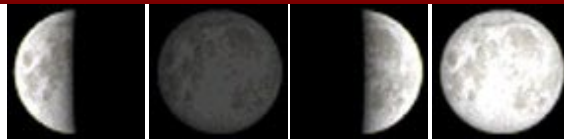
Mars is high in the southern sky at dusk, and it doesn't set in the north-west until dawn. Mars is moving steadily eastwards through the constellation of Cancer, passing just north of Praesepe, the "Beehive" star-cluster. The "Red Planet" shines with a steady orange glow, and it appears brighter than any of the nearby stars.

Jupiter is rising in the east less than an hour before sunrise; it will be very difficult to see the giant planet this month.

Saturn was at opposition to the Sun on March 22nd; this month it's very slightly further away from us, but rather more conveniently placed for evening viewing. It rises in the late afternoon, and it reaches its highest point in the sky, due south, in the late evening; it doesn't set until sunrise. It's about midway between the bright star Regulus in Leo, to its upper right, and the slightly brighter star Spica in Virgo, to its lower left.

The Lyrid **meteor-shower** is active during the third week of April, peaking probably in the afternoon of Thursday April 22nd. The meteors seem to radiate outwards from a point in the constellation of Lyra, close to the bright star Vega. The best time to look is in the early hours of the morning on the 22nd or 23rd

Last Qtr Apr 6 New Apr 14 First Qtr Apr 21 Full Apr 28



Sun and Moon Rise and Set

Date	Moonrise	Moonset	Sunrise	Sunset
4/1/2010	22:38	07:57	06:38	19:13
4/5/2010	01:28	11:22	06:33	19:16
4/10/2010	04:16	16:06	06:26	19:20
4/15/2010	06:40	21:02	06:19	19:24
4/20/2010	11:08	00:57	06:13	19:28
4/25/2010	16:51	04:03	06:07	19:32
4/30/2010	22:24	07:20	06:02	19:36

Planet Data

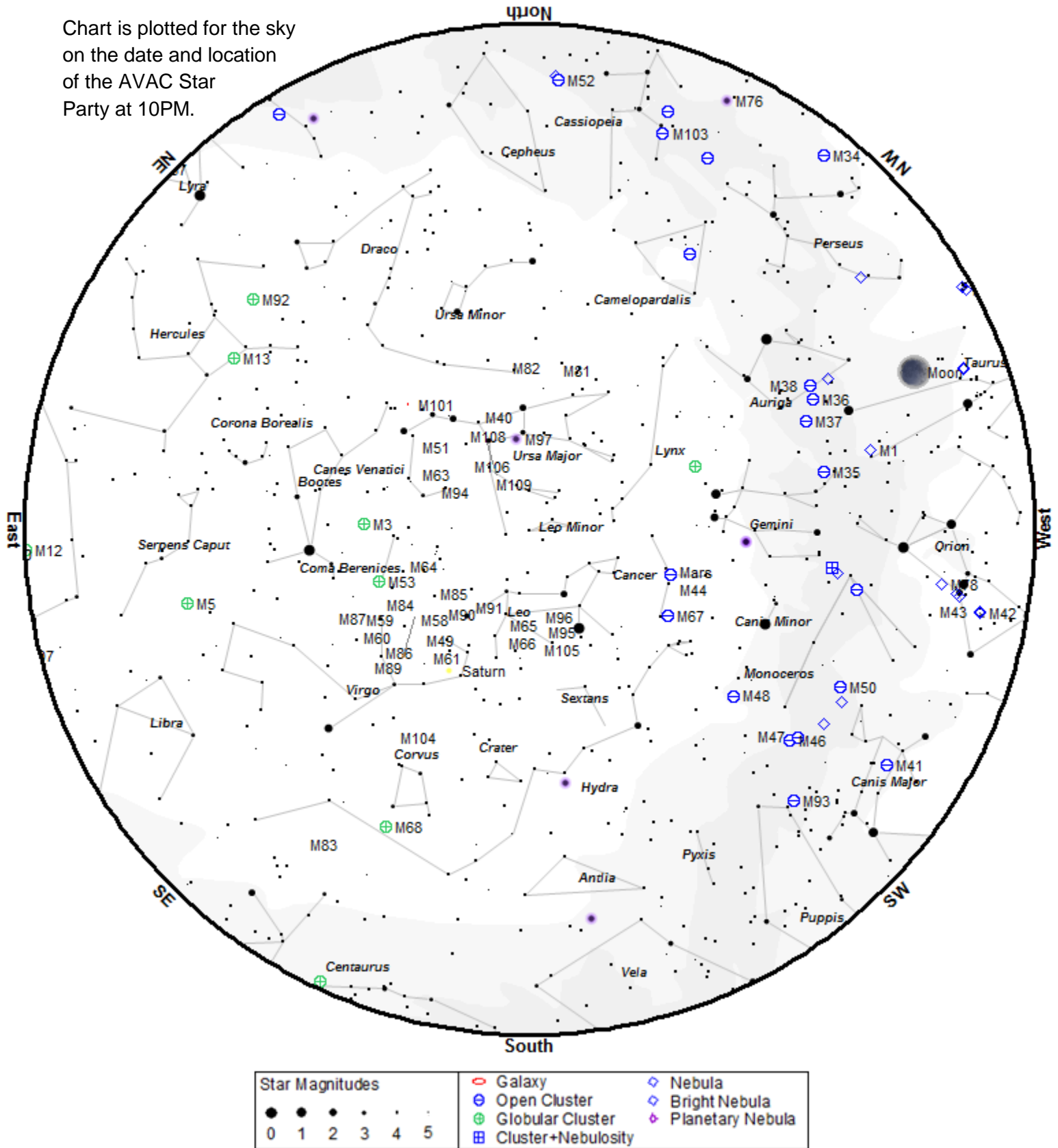
	Apr 1			
	Rise	Transit	Set	Mag
Mercury	07:14	13:58	20:43	-0.8
Venus	07:30	14:10	20:51	-3.9
Mars	13:22	20:36	03:49	0.2
Jupiter	05:35	11:25	17:19	-2.1
Saturn	18:04	00:17	06:29	0.6

	Apr 15			
	Rise	Transit	Set	Mag
Mercury	06:49	13:53	20:54	1.5
Venus	07:23	14:22	21:21	-3.9
Mars	12:48	19:57	03:06	0.5
Jupiter	04:48	10:42	16:39	-2.1
Saturn	17:04	23:18	05:32	0.7

	Apr 30			
	Rise	Transit	Set	Mag
Mercury	05:45	12:36	19:22	5.2
Venus	07:24	14:38	21:53	-3.9
Mars	12:17	19:20	02:23	0.7
Jupiter	03:57	09:54	15:55	-2.2
Saturn	16:01	22:16	04:30	0.8

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.



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 52	Open	8.2	Cas	23h24m48.0s	+61°35'36"	18:42	18:58	19:40	detectable
NGC 2355	Open	9.7	Gem	07h16m59.0s	+13°45'00"	19:08	19:46	22:23	difficult
NGC 2392	PNe	8.6	Gem	07h29m10.8s	+20°54'42"	19:28	19:57	22:06	obvious
M 44	Open	3.9	Cnc	08h40m24.0s	+19°40'00"	19:34	20:01	22:59	easy
M 67	Open	7.4	Cnc	08h51m18.0s	+11°48'00"	19:39	20:02	21:52	detectable
NGC 3132	PNe	8.2	Vel	10h07m01.8s	-40°26'11"	19:29	20:15	21:51	easy
NGC 3132	PNe	8.2	Vel	10h07m01.8s	-40°26'11"	19:29	20:15	21:51	easy
M 82	Gal	9.0	UMa	09h55m52.4s	+69°40'47"	19:35	20:16	02:05	easy
M 81	Gal	7.8	UMa	09h55m33.1s	+69°03'56"	19:35	20:16	01:50	detectable
NGC 3227	Gal	11.5	Leo	10h23m30.6s	+19°51'54"	19:39	20:28	23:31	difficult
NGC 3242	PNe	8.6	Hya	10h24m46.1s	-18°38'32"	19:28	20:31	22:22	obvious
M 65	Gal	10.1	Leo	11h18m55.7s	+13°05'32"	19:38	22:09	00:41	detectable
M 66	Gal	9.7	Leo	11h20m14.9s	+12°59'30"	19:36	22:09	00:46	detectable
M 106	Gal	9.1	CVn	12h18m57.6s	+47°18'13"	19:40	22:26	02:22	detectable
M 86	Gal	9.8	Vir	12h26m12.2s	+12°56'44"	19:53	22:33	01:27	detectable
M 84	Gal	10.1	Vir	12h25m03.9s	+12°53'12"	19:47	22:33	01:41	detectable
M 49	Gal	9.3	Vir	12h29m46.8s	+08°00'01"	19:47	22:37	01:45	detectable
M 87	Gal	9.6	Vir	12h30m49.2s	+12°23'29"	19:46	22:38	01:50	detectable
NGC 4565	Gal	10.1	Com	12h36m20.8s	+25°59'15"	19:54	22:44	01:45	difficult
M 68	Glob	7.3	Hya	12h39m28.0s	-26°44'36"	20:59	22:47	00:42	detectable
M 104	Gal	9.1	Vir	12h39m59.3s	-11°37'22"	20:13	22:48	01:24	detectable
M 94	Gal	8.7	CVn	12h50m53.1s	+41°07'12"	19:40	22:58	03:18	easy
M 64	Gal	9.3	Com	12h56m43.8s	+21°41'00"	19:48	23:04	02:40	detectable
NGC 5195	Gal	10.5	CVn	13h29m59.6s	+47°15'58"	19:58	23:37	03:28	detectable
M 51	Gal	8.7	CVn	13h29m52.3s	+47°11'40"	19:42	23:38	03:55	easy
M 83	Gal	7.8	Hya	13h37m00.8s	-29°51'56"	21:55	23:44	01:40	detectable
M 3	Glob	6.3	CVn	13h42m11.0s	+28°22'42"	20:00	23:49	03:45	easy
M 101	Gal	8.4	UMa	14h03m12.4s	+54°20'53"	20:30	00:10	03:50	detectable
M 5	Glob	5.7	Ser	15h18m34.0s	+02°05'00"	22:09	01:25	04:04	easy
M 80	Glob	7.3	Sco	16h17m02.0s	-22°58'30"	01:25	02:24	03:23	detectable
NGC 6178	Open	7.2	Sco	16h35m47.0s	-45°38'36"	01:32	02:43	03:51	easy
NGC 6193	Open	5.4	Ara	16h41m20.0s	-48°45'48"	02:02	02:48	03:34	easy
M 13	Glob	5.8	Her	16h41m41.0s	+36°27'36"	22:27	02:49	04:08	easy
M 12	Glob	6.1	Oph	16h47m14.0s	-01°56'48"	23:40	02:54	04:08	easy
M 10	Glob	6.6	Oph	16h57m09.0s	-04°06'00"	00:20	03:04	04:07	detectable
M 19	Glob	6.8	Oph	17h02m38.0s	-26°16'06"	01:19	03:09	04:04	detectable
M 62	Glob	6.4	Oph	17h01m13.0s	-30°06'48"	01:16	03:08	04:07	detectable
M 92	Glob	6.5	Her	17h17m07.0s	+43°08'12"	22:52	03:20	04:09	easy

ID	Cls	Mag	Con	RA 2000	Dec 2000	Begin	Best	End	Difficulty
M 9	Glob	7.8	Oph	17h19m12.0s	-18°31'00"	01:36	03:24	04:04	detectable
NGC 6322	Open	6.5	Sco	17h18m25.0s	-42°56'00"	01:52	03:25	04:12	easy
NGC 6543	PNe	8.3	Dra	17h58m33.4s	+66°37'59"	21:43	03:32	04:18	obvious
M 14	Glob	7.6	Oph	17h37m36.0s	-03°14'48"	00:58	03:32	04:07	detectable
IC 4665	Open	5.3	Oph	17h46m18.0s	+05°43'00"	00:57	03:34	04:05	detectable
M 97	PNe	11.0	UMa	11h14m47.7s	+55°01'09"	02:29	03:33	05:29	challenging
NGC 6383	Open	5.4	Sco	17h34m48.0s	-32°34'00"	01:39	03:36	04:11	easy
M 6	Open	4.6	Sco	17h40m20.0s	-32°15'12"	01:31	03:38	04:12	easy
M 23	Open	5.9	Sgr	17h57m04.0s	-18°59'06"	02:16	03:40	04:09	detectable
M 57	PNe	9.4	Lyr	18h53m35.1s	+33°01'45"	00:17	03:41	04:12	easy
NGC 6572	PNe	8.0	Oph	18h12m06.4s	+06°51'12"	00:29	03:41	04:21	obvious
NGC 6633	Open	5.6	Oph	18h27m15.0s	+06°30'30"	00:45	03:40	04:09	easy
M 56	Glob	8.4	Lyr	19h16m36.0s	+30°11'06"	01:42	03:41	04:05	detectable
IC 4756	Open	5.4	Ser	18h39m00.0s	+05°27'00"	01:20	03:41	04:07	easy
NGC 6871	Open	5.8	Cyg	20h05m59.0s	+35°46'36"	01:32	03:42	04:08	easy
M 16	Open	6.5	Ser	18h18m48.0s	-13°48'24"	02:00	03:42	04:13	obvious
M 17	Open	7.3	Sgr	18h20m47.0s	-16°10'18"	02:23	03:42	04:04	detectable
M 21	Open	7.2	Sgr	18h04m13.0s	-22°29'24"	03:03	03:42	04:07	detectable
M 20	Open	5.2	Sgr	18h02m42.0s	-22°58'18"	03:11	03:42	04:09	easy
NGC 7160	Open	6.4	Cep	21h53m40.0s	+62°36'12"	01:52	03:43	04:11	obvious
NGC 6910	Open	7.3	Cyg	20h23m12.0s	+40°46'42"	01:27	03:43	04:07	easy
M 29	Open	7.5	Cyg	20h23m57.0s	+38°30'30"	01:38	03:43	04:06	easy
M 8	Neb	5.0	Sgr	18h04m02.0s	-24°23'14"	01:36	03:42	04:11	easy
M 39	Open	5.3	Cyg	21h31m48.0s	+48°26'00"	02:06	03:45	04:06	easy
M 27	PNe	7.3	Vul	19h59m36.3s	+22°43'16"	01:45	03:44	04:07	easy
M 11	Open	6.1	Sct	18h51m05.0s	-06°16'12"	02:00	03:44	04:07	detectable
M 18	Open	7.5	Sgr	18h19m58.0s	-17°06'06"	02:23	03:43	04:12	easy
M 7	Open	3.3	Sco	17h53m51.0s	-34°47'36"	02:10	03:43	04:10	easy
NGC 7243	Open	6.7	Lac	22h15m08.0s	+49°53'54"	02:46	03:45	04:03	detectable
M 71	Glob	8.4	Sge	19h53m46.0s	+18°46'42"	01:47	03:44	04:08	easy
M 25	Open	6.2	Sgr	18h31m47.0s	-19°07'00"	02:53	03:45	04:06	detectable
NGC 7790	Open	7.2	Cas	23h58m24.0s	+61°12'30"	02:04	03:47	04:08	obvious
NGC 6716	Open	7.5	Sgr	18h54m34.0s	-19°54'06"	03:23	03:46	04:08	detectable
M 22	Glob	5.2	Sgr	18h36m24.0s	-23°54'12"	02:24	03:46	04:07	detectable
M 28	Glob	6.9	Sgr	18h24m33.0s	-24°52'12"	02:22	03:46	04:07	detectable
M 15	Glob	6.3	Peg	21h29m58.0s	+12°10'00"	03:29	03:49	04:05	easy
M 70	Glob	7.8	Sgr	18h43m13.0s	-32°17'30"	03:00	03:49	04:07	detectable
NGC 6818	PNe	10.0	Sgr	19h43m57.8s	-14°09'12"	03:28	03:51	04:15	easy
M 55	Glob	6.3	Sgr	19h40m00.0s	-30°57'42"	03:25	03:54	04:08	detectable
NGC 6723	Glob	6.8	Sgr	18h59m33.0s	-36°37'54"	03:21	03:54	04:08	detectable
NGC 5986	Glob	7.6	Lup	15h46m03.0s	-37°47'12"	02:58	04:12	04:56	detectable
NGC 6167	Open	6.6	Nor	16h34m34.0s	-49°46'18"	04:11	04:46	05:02	easy
NGC 5897	Glob	8.4	Lib	15h17m24.0s	-21°00'36"	05:14	05:27	05:41	difficult

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.
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- Desert Sky Observer—monthly newsletter.
- The Reflector – the publication of the Astronomical League.
- The A.V.A.C. Membership Manual.
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