ANTELOPE VALLEY ASTRONOMY CLUB, INC.

Desert Sky Observer

Volume 31 *Antelope Valley Astronomy Club Newsletter* **January 2011**

Up-Coming Events

January 8: Star Party @ Vasquez Rocks
January 14: Club Meeting*
January 17: Board meeting @ Don's house

* 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 New Year! I hope this reaches you before the star party on the eighth. This is our Dark Sky Star Party for January and it's going to be a joint effort with the Local Group – the Astro club from Santa Clarita. We have a unique opportunity to observe from Vasquez Rocks State Park – the site of many classic TV shows and movies – my personal favorite is "Arena", the Star Trek episode featuring the Gorn. Maybe we can show up early and try to construct a bamboo and gunpowder cannon (though I'd just settle for finding some big diamonds lying around on the ground).

There are many other great events planned for 2011 including the annual Messier Marathon, RTMC (over Memorial weekend this year!), and of course our summertime weekends at Mt. Pinos. I'm hoping to debut the club's new 13" truss dob at the Messier Marathon as well. This scope, a former Coulter dobsonian that was donated to the club, has been refigured and transformed into a very portable, very easy to use visual scope. And any member who's had the beginner class can check it out! (if you can get it away from me…).

As for our monthly meetings you can expect the excellent quality of our guest speakers to continue (see Rose's article below for the juicy details). I'll just mention that I'm looking forward to Jeremy's talk on Charles Messier and his famous list just in time for our Messier Marathon.

I hope to see everyone out at Vasquez Rocks or come out to my place in February for a Lunar Club/Star Party on the 5th, so happy 2011 and clear skies!

Vice President

Rose Moore

Happy New Year everyone! Hope you all are having a wonderful holiday season! Thanks to all for making our Christmas Party such a success. We all had a great time! Anyone who donated items for the raffle and/or auction, please email me with a list of items you donated, (for tax purposes).

Coming up for speakers, we have Jeff Zweerink returning for the January 14th meeting. Jeff is with 'Reasons to Believe' and will be speaking on possibly dark matter or a related subject to be announced. Jeff gave us a presentation last year, simplifying some of the recent theories on dark matter. For February we have Albion Bowers from NASA Dryden speaking on 'Aeronautics Missions at NASA Dryden'. Our own Jeremy Amarant will be speaking in March on Messier objects in preparation for the Messier Marathon the beginning of April.

Please come out to the meetings and support your astronomy club! Bring friends,family, and kids! We need your support in keeping this club active and effective for its members and public outreach!

Clear skies

Director of Community Development

Robert Lynch

Thanks to all who made our Christmas Party a great success!! And thanks to all who donated items for the silent auctions and the raffles. A great time was had by all!!

2011 is here and I encourage club members to come out and become more involved with the club, even for just one event! Maybe you can attend more club meetings, or come to more community outreach events, attend one extra star party, or help a board member on a committee or project. Whatever you can do helps our club continue its successful journey!

For the month of January, we do not have any public outreach events but do have our monthly club star party coming up at Vasquez Rocks on Saturday, 1/8. Let's hope for some clear, dry, and less chilly weather!

Coming up in February, is the Leona Valley Elementary School Science Fair. We will need members to help make this a fun and successful event!

Space Place

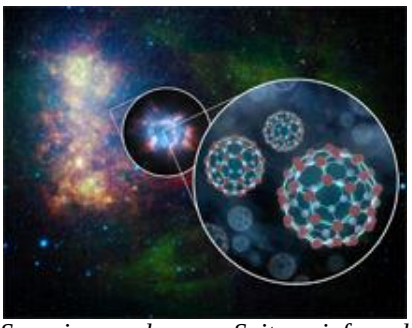
Astronomers Stumble onto Huge Space Molecules

By Trudy E. Bell and Tony Phillips

Deep in interstellar space, in a the swirling gaseous envelope of a planetary nebula, hosts of carbon atoms have joined together to form large three-dimensional molecules of a special type previously seen only on Earth. Astronomers discovered them almost accidentally using NASA's Spitzer Space Telescope.

"They are the largest molecules known in space," declared Jan Cami of the University of Western Ontario, lead author of a paper with three colleagues published in *Science* online on July 22, 2010, and in print on September 3.

Not only are the molecules big: they are of a special class of carbon molecules known as "fullerenes" because their structure resembles the geodesic domes popularized by architect Buckminster Fuller. Spitzer found evidence of two types of fullerenes. The smaller type, nicknamed the "buckyball," is chemical formula C_{60}, made of 60 carbon atoms joined in a series of hexagons and pentagons to form a spherical closed cage exactly like a black-and-white soccer ball. Spitzer also found a larger fullerene, chemical formula C_{70}, consisting of 70 carbon atoms in an elongated closed cage more resembling an oval rugby ball.



Superimposed on a Spitzer infrared photo of the Small Magellanic Cloud is an artist's illustration depicting a magnified view of a planetary nebula and an even further magnified view of buckyballs, which consist of 60 carbon atoms arranged like soccer balls.

Neither type of fullerene is rigid; instead, their carbon atoms vibrate in and out, rather like the surface of a large soap bubble changes shape as it floats through the air. "Those vibrations correspond to wavelengths of infrared light emitted or absorbed—and that infrared emission is what Spitzer recorded," Cami explained.

Although fullerenes have been sought in space for the last 25 years, ever since they were first identified in the laboratory, the astronomers practically stumbled into the discovery. Co-author Jeronimo Bernard-Salas of Cornell University, an expert in gas and dust in planetary nebulae, was doing routine research with Spitzer's infrared observations of planetary nebulae with its spectroscopy instrument. When he studied the spectrum (infrared signature) of a dim planetary nebula called Tc 1 in the southern-hemisphere constellation of Ara, he noticed several clear peaks he had not seen before in the spectra of other planetary nebulae.

"When he came to me," recounted Cami, an astrophysicist who specializes in molecular chemistry, "I immediately and intuitively knew it I was looking at buckyballs in space. I've never been that excited!" The authors confirmed his hunch by carefully comparing the Tc 1 spectrum to laboratory experiments described in the literature.

"This discovery shows that it is possible—even easy—for complex carbonaceous molecules to form spontaneously in space," Cami said. "Now that we know fullerenes are out there, we can figure out their roles in the physics and chemistry of deep space. Who knows what other complex chemical compounds exist—maybe even some relevant to the formation of life in the universe!"

Stay tuned!

Learn more about this discovery at http://www.spitzer.caltech.edu.

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

NASA's Spitzer Reveals First Carbon-Rich Planet
Astronomers have discovered that a huge, searing-hot planet orbiting another star is loaded with an unusual amount of carbon. The planet, a gas giant named WASP-12b, is the first carbon-rich world ever observed. The discovery was made using NASA's Spitzer Space Telescope, along with previously published ground-based observations.
http://www.spitzer.caltech.edu/news/1231-ssc2010-10-NASA-s-Spitzer-Reveals-First-Carbon-Rich-Planet

New pictures show fourth planet in giant version of our solar system
Astronomers have discovered a fourth giant planet, joining three others that, in 2008, were the subject of the first-ever pictures of a planetary system orbiting another star other than our sun. The solar system orbits around a dusty young star named HR8799, which is 129 light years away. All four planets are roughly five to seven times the mass of Jupiter.
https://www.llnl.gov/news/newsreleases/2010/Dec/NR-10-12-02.html

Herschel looks back in time to see stars bursting into life
A UK-led international team of astronomers have presented the first conclusive evidence for a dramatic surge in star birth in a newly discovered population of massive galaxies in the early Universe. Their measurements confirm the idea that stars formed most rapidly about 11 billion years ago, or about three billion years after the Big Bang, and that the rate of star formation is much faster than was thought.
http://www.ras.org.uk/news-and-press/157-news2010/1903-herschel-looks-back-in-time-to-see-stars-bursting-into-life

WISE Sees an Explosion of Infrared Light
A circular rainbow appears like a halo around an exploded star in this new view of the IC 443 nebula from NASA's Wide-field Infrared Survey Explorer, or WISE.When massive stars die, they explode in tremendous blasts, called supernovae, which send out shock waves. The shock waves sweep up and heat surrounding gas and dust, creating supernova remnants like the one pictured here.
http://www.spaceref.com/news/viewpr.html?pid=32257

How Often Do Giant Black Holes Become Hyperactive?
A new study from NASA's Chandra X-ray Observatory tells scientists how often the biggest black holes have been active over the last few billion years. This discovery clarifies how supermassive black holes grow and could have implications for how the giant black hole at the center of the Milky Way will behave in the future.
http://www.nasa.gov/mission_pages/chandra/news/10-169.html

Black Holes and Warped Space Revealed by Powerful New Array of Radio Telescopes
A new image shows how the light from a quasar billions of light years away is bent around a foreground galaxy by the curvature of space. This light has been traveling for 9 billion years before it reached the Earth. The quasar is a galaxy powered by a super-massive black hole, leading to the ejection of jets of matter moving at almost the speed of light.
http://www.sciencedaily.com/releases/2010/12/101208202154.htm

Astrophoto of The Month

M42, the Orion Nebula
By Don Bryden

Taken from 9/2010 thru 12/2010 at Two Goats Observatory. A composite image through Luminance, Ha and OIII narrowband filters on a Stellarvue SV-105 refractor and RGB broadband filters through a Vixen VC200L corrected Cassegrain and imaged on a SBIG ST10XME camera on a Schaefer GEM. Part of the Running Man nebula and Orion molecular cloud complex can be seen to the left.

January Sky Data

Best time for deep sky observing this month:
January 1 through January 8

Mercury is at its greatest elongation westwards of the Sun on January 9th, and we have a chance to glimpse this elusive little planet in the south-eastern sky at dawn. In the first week of January, try looking to the south-east around 7:30 am. Mercury should appear like a tiny, star-like point of light, very low down in the twilight sky. It is much lower than brilliant Venus, further to the left, and very much fainter.

Venus is still a brilliant "Morning Star" this month, visible low in the south-eastern sky before sunrise, but it appears a little lower down every morning. Relative to the stars, Venus begins the month in the constellation of Libra and moves quickly eastwards, crossing through the top section of Scorpius between January 9th and 14th, and then moving on into Ophiuchus.

Mars will be at conjunction (almost directly behind the Sun) next month. This January the "Red Planet" sets only minutes after the Sun, so we won't be able to see it.

Jupiter is the one planet that is convenient for viewing in the evenings this month. The giant planet is visible in the south-western sky as soon as the sky starts to get dark, and it doesn't set till nearly midnight. It looks like a very bright star, shining with a strong, steady light. Relative to the genuine stars – which are all much fainter – Jupiter is moving slowly north-eastwards in Pisces.

Saturn is rising in the early hours of the morning, and it's well up in the southern sky before dawn. Don't confuse it with the planet Venus, which is a bit lower down, much further left, and very much brighter. Relative to the stars, Saturn is in the constellation of Virgo, a little above and to the right of Spica.

The Quadrantid **meteor shower** produces a good display of meteors every year during the first week of January. The radiant point for this shower is in the now-disused constellation of Quadrans Muralis, between the bright star Vega and the "handle" of the Plough. This year the peak is expected around midnight on the night of Monday January 3rd, so the best numbers will probably be seen in the early hours of Tuesday morning.

Sun and Moon Rise and Set

Date	Moonrise	Moonset	Sunrise	Sunset
1/1/2011	04:35	14:33	06:59	16:51
1/5/2011	07:50	18:31	06:59	16:55
1/10/2011	10:14	23:11	06:59	16:59
1/15/2011	13:09	03:03	06:58	17:04
1/20/2011	18:31	07:21	06:57	17:09
1/25/2011	------	10:18	06:54	17:14
1/31/2011	05:08	15:21	06:50	17:20

Planet Data

Jan 1

	Rise	Transit	Set	Mag
Mercury	05:18	10:24	15:32	0.0
Venus	03:19	08:40	14:01	-4.5
Mars	07:33	12:31	17:29	1.2
Jupiter	10:57	16:57	22:55	-2.4
Saturn	00:19	06:11	12:07	0.8

Jan 15

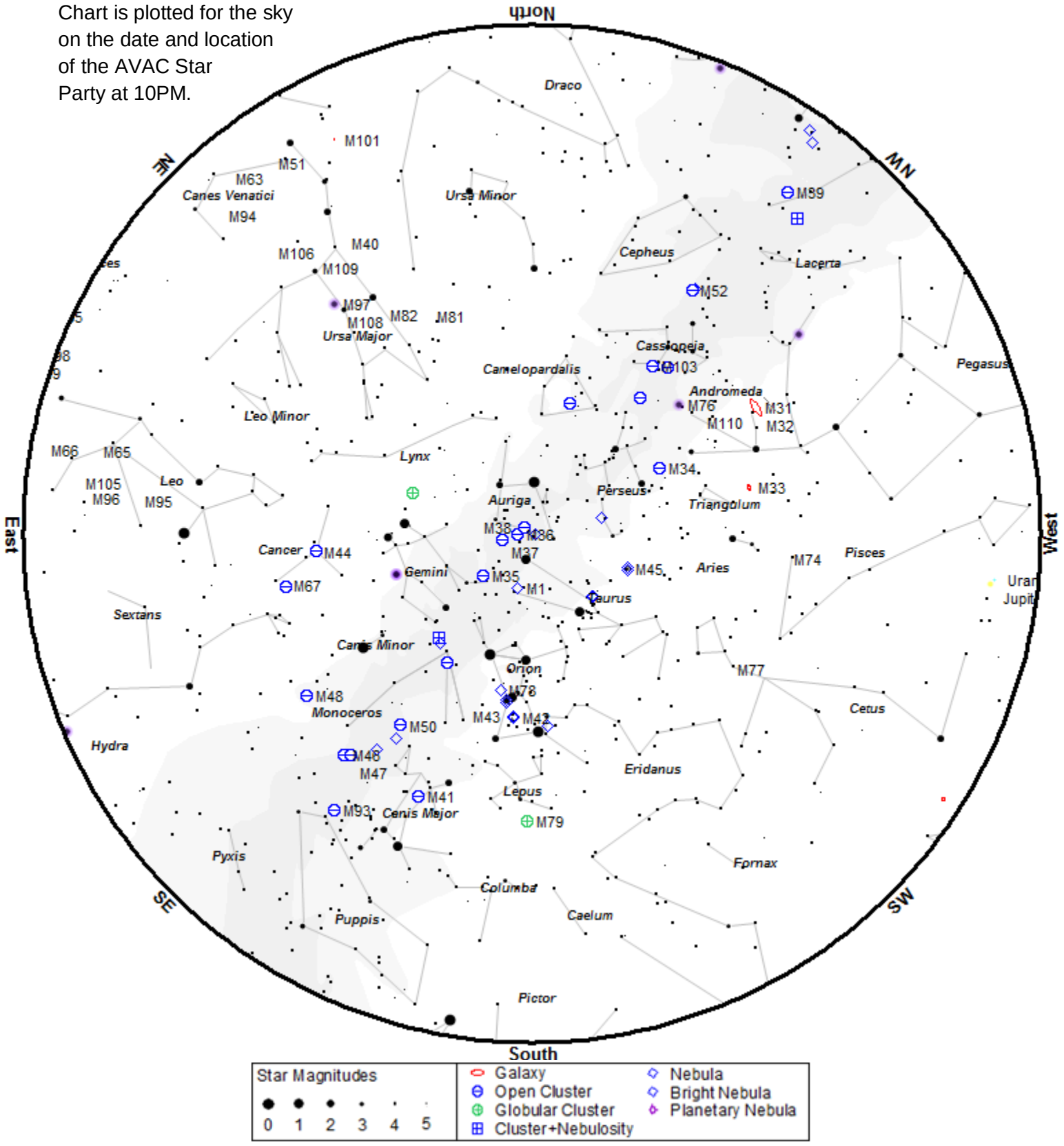
	Rise	Transit	Set	Mag
Mercury	05:28	10:27	15:24	-0.2
Venus	03:31	08:43	13:55	-4.4
Mars	07:18	12:22	17:26	1.1
Jupiter	10:07	16:10	22:10	-2.3
Saturn	23:26	05:17	11:09	0.7

Jan 31

	Rise	Transit	Set	Mag
Mercury	06:01	11:02	16:00	-0.4
Venus	03:49	08:54	13:59	-4.3
Mars	06:56	12:11	17:24	1.1
Jupiter	09:11	15:18	21:21	-2.2
Saturn	22:23	04:15	10:07	0.6

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.

Cls	ID	Mag	Con	RA 2000	Dec 2000	Begin	Best	End	Difficulty
Open	M 52	8.2	Cas	23h24m48.0s	+61°35'36"	17:58	18:23	22:04	challenging
Open	NGC 7789	7.5	Cas	23h57m24.0s	+56°42'30"	17:58	18:25	21:56	challenging
Open	NGC 7790	7.2	Cas	23h58m24.0s	+61°12'30"	17:58	18:25	22:19	easy
Gal	M 110	8.9	And	00h40m22.3s	+41°41'09"	18:08	18:26	19:41	challenging
Gal	M 31	4.3	And	00h42m44.3s	+41°16'07"	18:02	18:26	20:51	detectable
Gal	M 32	8.9	And	00h42m41.8s	+40°51'58"	18:00	18:26	20:58	detectable
Open	NGC 457	5.1	Cas	01h19m35.0s	+58°17'12"	17:58	18:31	22:56	easy
Gal	M 33	6.4	Tri	01h33m50.9s	+30°39'36"	18:04	18:31	20:45	difficult
Open	NGC 559	7.4	Cas	01h29m31.0s	+63°18'24"	17:59	18:33	23:17	easy
Open	M 103	6.9	Cas	01h33m23.0s	+60°39'00"	17:57	18:33	23:53	easy
PNe	M 76	10.1	Per	01h42m19.9s	+51°34'31"	18:04	18:35	21:19	difficult
Open	NGC 637	7.3	Cas	01h43m04.0s	+64°02'24"	17:55	18:36	00:25	easy
Open	NGC 663	6.4	Cas	01h46m09.0s	+61°14'06"	18:00	18:37	22:56	detectable
Open	NGC 869	4.3	Per	02h19m00.0s	+57°07'42"	17:55	18:58	00:31	obvious
Open	NGC 884	4.4	Per	02h22m18.0s	+57°08'12"	17:56	19:01	00:32	easy
Open	NGC 957	7.2	Per	02h33m21.0s	+57°33'36"	18:02	19:12	23:23	detectable
Open	M 34	5.8	Per	02h42m05.0s	+42°45'42"	18:05	19:21	22:29	detectable
Open	NGC 1027	7.4	Cas	02h42m40.0s	+61°35'42"	17:58	19:21	00:56	challenging
Gal	M 77	9.7	Cet	02h42m40.8s	-00°00'48"	18:08	19:22	21:32	difficult
Open	NGC 1342	7.2	Per	03h31m38.0s	+37°22'36"	18:06	20:09	23:10	detectable
Open	M 45	1.5	Tau	03h47m00.0s	+24°07'00"	17:59	20:25	00:31	easy
Open	NGC 1444	6.4	Per	03h49m25.0s	+52°39'30"	17:56	20:26	02:04	obvious
Open	NGC 1502	4.1	Cam	04h07m50.0s	+62°19'54"	17:54	21:23	02:49	obvious
Open	NGC 1528	6.4	Per	04h15m23.0s	+51°12'54"	18:06	21:23	00:49	detectable
Open	NGC 1647	6.2	Tau	04h45m55.0s	+19°06'54"	19:41	21:25	23:17	difficult
Open	NGC 1664	7.2	Aur	04h51m06.0s	+43°40'30"	18:08	21:31	01:23	detectable
Open	NGC 1746	6.1	Tau	05h03m50.0s	+23°46'12"	19:52	21:43	23:41	difficult
Glob	NGC 1851	7.1	Col	05h14m06.0s	-40°02'48"	19:56	21:53	23:52	challenging
Open	M 38	6.8	Aur	05h28m40.0s	+35°50'54"	19:26	22:09	00:55	detectable
Neb	M 42	4.0	Ori	05h35m18.0s	-05°23'00"	19:08	22:15	01:23	easy
Open	M 36	6.5	Aur	05h36m18.0s	+34°08'24"	18:21	22:16	02:14	easy
Open	M 37	6.2	Aur	05h52m18.0s	+32°33'12"	18:50	22:32	02:16	easy
Open	NGC 2129	7.0	Gem	06h01m07.0s	+23°19'20"	18:35	22:41	02:48	easy
Open	NGC 2169	7.0	Ori	06h08m24.0s	+13°57'54"	18:58	22:48	02:40	easy
Open	NGC 2175	6.8	Ori	06h09m39.0s	+20°29'12"	20:35	22:49	01:09	difficult
Open	M 35	5.6	Gem	06h09m00.0s	+24°21'00"	19:35	22:49	02:07	detectable
Open	NGC 2264	4.1	Mon	06h40m58.0s	+09°53'42"	20:04	23:20	02:40	easy
Open	M 41	5.0	CMa	06h46m01.0s	-20°45'24"	21:47	23:25	01:04	detectable

Cls	ID	Mag	Con	RA 2000	Dec 2000	Begin	Best	End	Difficulty
Open	NGC 2301	6.3	Mon	06h51m45.0s	+00°27'36"	20:42	23:32	02:23	detectable
Open	M 50	7.2	Mon	07h02m42.0s	-08°23'00"	21:45	23:42	01:41	detectable
Open	NGC 2353	5.2	Mon	07h14m30.0s	-10°16'00"	21:06	23:54	02:42	easy
Open	NGC 2355	9.7	Gem	07h16m59.0s	+13°45'00"	20:06	23:56	03:49	challenging
PNe	NGC 2392	8.6	Gem	07h29m10.8s	+20°54'42"	19:41	00:08	04:37	easy
Open	M 47	4.3	Pup	07h36m35.0s	-14°29'00"	21:51	00:16	02:41	easy
Open	NGC 2423	7.0	Pup	07h37m06.0s	-13°52'18"	22:08	00:17	02:25	detectable
Open	NGC 2439	7.1	Pup	07h40m45.0s	-31°41'36"	22:46	00:20	01:55	detectable
Open	M 46	6.6	Pup	07h41m46.0s	-14°48'36"	22:37	00:21	02:05	detectable
PNe	NGC 2440	11.5	Pup	07h41m55.4s	-18°12'31"	22:52	00:21	01:50	challenging
Open	M 93	6.5	Pup	07h44m30.0s	-23°51'24"	23:25	00:24	01:23	detectable
Open	NGC 2451	3.7	Pup	07h45m23.0s	-37°57'21"	23:01	00:24	01:48	detectable
Open	NGC 2477	5.7	Pup	07h52m10.0s	-38°31'48"	23:06	00:31	01:56	detectable
Open	NGC 2506	8.9	Mon	08h00m01.0s	-10°46'12"	21:53	00:39	03:25	challenging
Open	NGC 2547	5.0	Vel	08h10m09.0s	-49°12'54"	23:24	00:49	02:14	difficult
Open	NGC 2571	7.4	Pup	08h18m56.0s	-29°45'00"	23:20	00:58	02:35	detectable
Open	M 44	3.9	Cnc	08h40m24.0s	+19°40'00"	22:09	01:19	04:30	detectable
Open	M 67	7.4	Cnc	08h51m18.0s	+11°48'00"	21:52	01:30	05:09	challenging
Gal	M 81	7.8	UMa	09h55m33.1s	+69°03'56"	22:38	02:35	05:51	detectable
Gal	M 82	9.0	UMa	09h55m52.4s	+69°40'47"	22:08	02:36	05:53	detectable
PNe	NGC 3132	8.2	Vel	10h07m01.8s	-40°26'11"	01:07	02:46	04:24	easy
Open	NGC 3228	6.4	Vel	10h21m22.0s	-51°43'42"	02:26	03:01	03:33	detectable
Gal	NGC 3227	11.5	Leo	10h23m30.6s	+19°51'54"	22:56	03:02	06:00	challenging
PNe	NGC 3242	8.6	Hya	10h24m46.1s	-18°38'32"	01:06	03:03	05:01	easy
Gal	M 65	10.1	Leo	11h18m55.7s	+13°05'32"	01:49	03:57	05:47	difficult
Gal	M 66	9.7	Leo	11h20m14.9s	+12°59'30"	01:48	03:59	05:48	difficult
Gal	M 106	9.1	CVn	12h18m57.6s	+47°18'13"	02:34	04:57	05:53	difficult
Gal	M 84	10.1	Vir	12h25m03.9s	+12°53'12"	03:01	05:04	05:52	difficult
Gal	M 86	9.8	Vir	12h26m12.2s	+12°56'44"	01:13	05:05	06:02	challenging
Gal	M 49	9.3	Vir	12h29m46.8s	+08°00'01"	03:00	05:08	05:52	difficult
Gal	M 87	9.6	Vir	12h30m49.2s	+12°23'29"	03:02	05:09	05:53	difficult
Gal	NGC 4565	10.1	Com	12h36m20.8s	+25°59'15"	01:03	05:13	06:03	challenging
Gal	M 104	9.1	Vir	12h39m59.3s	-11°37'22"	03:18	05:17	05:54	detectable
Glob	M 68	7.3	Hya	12h39m28.0s	-26°44'36"	03:48	05:17	05:52	difficult
Gal	M 94	8.7	CVn	12h50m53.1s	+41°07'12"	02:14	05:22	05:57	detectable
Gal	M 64	9.3	Com	12h56m43.8s	+21°41'00"	02:57	05:24	05:55	detectable
Gal	M 51	8.7	CVn	13h29m52.3s	+47°11'40"	02:36	05:30	05:57	detectable
Gal	NGC 5195	10.5	CVn	13h29m59.6s	+47°15'58"	03:41	05:30	05:52	challenging
Gal	M 101	8.4	UMa	14h03m12.4s	+54°20'53"	01:33	05:32	06:01	challenging
Glob	M 3	6.3	CVn	13h42m11.0s	+28°22'42"	03:01	05:32	05:58	detectable
Gal	M 83	7.8	Hya	13h37m00.8s	-29°51'56"	04:43	05:36	05:54	difficult
Glob	M 5	5.7	Ser	15h18m34.0s	+02°05'00"	04:39	05:38	05:54	detectable
PNe	NGC 6543	8.3	Dra	17h58m33.4s	+66°37'59"	04:22	05:40	06:07	obvious
Glob	M 92	6.5	Her	17h17m07.0s	+43°08'12"	04:43	05:40	05:56	detectable
Glob	M 13	5.8	Her	16h41m41.0s	+36°27'36"	04:37	05:40	05:56	detectable

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.

AVAC
P.O. BOX 8545,
LANCASTER, CA 93539-8545

Visit the Antelope Valley Astronomy Club website at www.avastronomyclub.org/

The Antelope Valley Astronomy Club, Inc. is a 501(c)(3) Non-Profit Corporation.

The A.V.A.C. is a Sustaining Member of The Astronomical League and the International Dark-Sky Association.

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