



# Desert Sky Observer

Volume 31

Antelope Valley Astronomy Club Newsletter

October 2011

## Up-Coming Events

- October 14: Annual Business meeting\*
- October 15: Prime Desert Woodland Moon Walk @ [Prime Desert Woodlands](#)
- October 17: Board meeting @ [Don's house](#)
- October 22: Glory of the Universe Star Party @ [Rosamond](#)
- October 26: Acton Library Astronomy Lecture and Star Party @ [Acton Library](#)
- October 29: Halloween Star Party @ [Two Ghost Observatory](#)

\* 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 20<sup>th</sup> 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

October already! And look at all the upcoming events: On the 15<sup>th</sup> you can come out to Prime Desert to take a moonwalk with Jeremy or set up your scope and show the heavens to the public. On the 22<sup>nd</sup>, club members and the public will converge on Rosamond for Lee & Millie's annual "Glory of the Universe" star party where not only will you have nice dark, steady skies but music, food and astronomy talks too! Come out the 26<sup>th</sup> to Acton Library and hear Jeremy talk about comets and asteroids and finally it's back to Two Goats for a Halloween-themed star party with prizes for the best costumes.

In fact, each and every month your club is offering talks, putting on star parties, doing public outreach events or just getting together and having fun. Each month you can choose from local or more remote star parties, talks at the SAGE planetarium or Acton Library, monthly dome shows at the SAGE as well as the occasional get together such as the yearly club picnic and Christmas Party. Of course you can also check out telescopes, eye pieces, finder scopes, mounts & tripods, books, CD's, software... the list goes on! Not bad for \$25 or \$30 a year.

So I bet you're thinking, "If there was only some way of giving back more to the AVAC..." Of course many of you bring cool items to raffle at the meetings and picnic. Some help out at schools and outreach events while still others are just always there for us board members to count on. But can you always count on your board being there? It seems like there will always be a meeting, a star party or a Prime Desert Moonwalk. You can count on that mid-summer picnic – probably at Steve's – and come December we'll probably have a nice dinner and auction/raffle for our Christmas Party. You'll expect to see us out at the Poppy Festival or Joe Walker with our solar scopes. Mr. Water Heater, the Marv scope and the Footscope will probably be set up in the parking lot at Mt. Pinos as well as Rose's Celestron and Darrell's Meade showing off the Veil or M13 or some such DSO.

What would we do if there was no SAGE to meet at? What would we do if our VP didn't have another great speaker for us to hear each month? What would we do if the DoCD didn't get us a space at the Poppy

Festival or the Secretary and Treasurer didn't get prizes and donations for the picnic, Poppy Festival, YEA contest and so on? Well I suppose life would go on – but would the club? Probably not.

This October 14<sup>th</sup> is the AVAC annual business meeting and your chance to make a difference and really help your club. We need members who would be able to work on the board or serve as committee chairs. So please consider becoming a more active member. Talk to a current board member about nominating yourself for a board position (hint: the president has the easiest job!) or volunteering for a committee. We especially need a library chair and a Director of Community Development but all positions on the board or committees are available for eager members – so let's all help our club this October and get involved!



## Vice President

### Rose Moore

A wonderful time was had by all who attended PATS this past weekend! While there were fewer vendors, there was a good crowd, especially on Saturday. The big raffle prize on Sunday was a 16 inch Lightbridge, won by a young couple and their 2 kids! Thanks to all the members who came out, whether to just browse and attend the talks, or to help out at the booth! Can't wait till next year!

Our annual business meeting is on Friday, October 14th! Please come out and vote for next year's board and show your support for the club.

We have a Prime Desert Woodlands Moon Walk with Jeremy on Saturday, Oct. 15th at 7pm. Come out with your telescopes or other astronomy items of interest, and show the public the night sky!

On Saturday, Oct. 22nd will be the Glory of the Universe Star Party in Rosamond, hosted by AVAC member Lee Bush and the Willow Springs Christian Fellowship. The event, which starts at 3pm, will include live bands, astronomy talks, stargazing, free BBQ, and free breakfast. This event is also open to the public. We need members with telescopes or other items of interest. For information, please contact Lee Bush at 661-724-0341. Please check out website calendar for map.

On Wednesday, Oct. 26th at 6:30 pm is 'Comets and Asteroids' lecture with Jeremy at the Acton Library. Come on out and attend a wonderful lecture and maybe a bit of stargazing afterwards, weather permitting!

And don't forget our club Star Party at Two Ghosts Observatory!! See you there!!

Clear skies!

## Did You Know....

It takes one to two million years for a photon to escape from the core of the sun to the surface. Then it takes less than 8 minutes to travel 93 million miles to earth.



## Secretary

### Frank Moore

Hi folks, Rose and I are just back from spending the weekend at the Pacific Astronomy and Telescope Show (PATs) at the convention center in Pasadena. Our booth was manned by Rose and I, Darrell and Nick Bennett, and Robert Lynch with occasional visits by other members of the AVAC. Ann Enevoldson stopped by and took a shift on Saturday so Rose could get lunch, but by the time Rose got there the snack bar had closed.

Farah and Jon from our sponsor, Woodland Hills Camera and Telescope, were the first people Rose and I saw when we entered the lobby Saturday morning. They were hanging a tattered banner in the lobby and I said, "Hey, I've seen that banner in a tree."

It was a bit battered and still had pine pitch on it from when it was blown into a tree, along with their booth, in the devastating windstorm at RTMC in May.

Darrell walked into the lobby a few minutes later...the first thing out of his mouth, "Hey, I've seen that banner in a tree,"...and we all laughed.

They had a new banner above the booth. I showed Farah our sponsor board, with the Woodland Hills Telescopes logo prominently displayed, and she couldn't believe it.

She said, "You guys are so sweet for doing that."

When we initially walked into the hall at 8:00 Saturday morning I was a bit disappointed at what appeared to be a rather dismal turnout from vendors. There seemed to be a lot of empty space. However, as the weekend progressed and after the reception we got at our booth I think it was more than worth the effort.

Alex McConahay from the Riverside Astronomical Society reported on Saturday that it was the biggest turnout of public attendees that they've ever had. We seemed awfully busy in our booth so I might tend to believe this.

Our booth was very BUSY Saturday. It seems like we always had a crowd. Rose and I never even got away for lunch. Other than a few chocolate chip cookies, we didn't eat anything till dinner at 8:00 PM. Club members that stopped by included Thaddeus Grzelak, Tom Koonce, Bill and Pam Grove, Dr. Mahadevan, Dale Rich, Charles Turner, Anthony Thomas. We know there were others, but can't remember all of the names or find all of our notes. Please forgive our oversight if your name was omitted. Other visitors included past members of the AVAC who have moved away from the area and joined other Southern California clubs.

I can't remember when we've ever had so many visitors. Among them were officers from the High Desert Astronomical Society, The Local Group, China Lake Astronomical Society, and others. Many of these officers expressed a desire to do joint events with OUR club. Rose and I mentioned this in a conversation with Frank (President) & Linda Boecker of the Riverside Astronomical Society, and he said it's because the word is out that we're a very active group and that less active clubs would like to do events with us and get a little of our mojo. We were astounded that we have that kind of reputation and recognition. He once again extended an invitation for us to come out to the RAS observing site "GMARS" near Landers. I think we may have to organize a Star Safari.

As I mentioned previously, it seemed there was a dismal turnout of vendors and manufacturers. The entire right rear 1/4 of the building was curtained off and they didn't even try to use it. In spite of the reduced available space, there were still many empty slots and blank walls. The opinion of the vendors I spoke to was that this was a combination of the economy and perhaps too many similar events in the region.

On Saturday morning Darrell and Nick attended a lecture titled, "Astronomers Like You Can Change the World", with Bill Nye (The Science Guy). When they returned they proudly displayed the pictures they had taken with Bill Nye. Rose and I ran over to the Planetary Society booth so she could also get her picture taken with Bill Nye but...by the time we got there...he had left the building. Sigh!!

I attended a lecture titled, "Preserving the Night Sky: Why you should care." with Scott Kardel from the International Dark Sky Association. This was followed by a workshop and round table discussion, lead by Scott Kardel, on preserving the night sky in our local communities. Some of our members may remember Scott Kardel since he was the Director of Public Relations for the Palomar Observatory for the last eight years and spoke at our meetings on several occasions. As of August, he is the Public Affairs Director for the [International Dark Sky Association](http://www.ida-astronomy.org) and has moved back to his hometown of Tucson, AZ where the IDA is based. Rose and I look forward to visiting him when he go to Tucson to visit our daughter Hannah at the University of Arizona.

Woodland Hills Telescopes had a drawing for some eyepieces on Saturday.

Oceanside Photo and Telescope (OPT) had kids drawings, and adult drawings, on both Saturday and Sunday. Saturday they gave a First Scope, some binoculars, and little accessories to kids and awarded an 8" Skywatcher Dob to an adult. On Sunday, they awarded three 70mm Vixen Refractors (the same telescope we gave to our YEA contest winners) to kids. They then awarded a 90mm Skywatcher Refractor, on an Alt/Az mount, and our own Robert Lynch was the winner.

The Grand Door Prize on Saturday was a Celestron Nexstar 6" Max/Cass & Mount.

The Grand Door Prize on Sunday was a 16" Meade Lightbridge. A total beginner with two little kids and who had just joined the RAS won this. Can you imagine, your first telescope a 16" Dobsonian Reflector? One of his sons had won a 70mm Vixen at OPT earlier in the day. Upon learning that the little boy had also won a telescope earlier in the day, Alex McConahay said he was going to rub their heads for luck before he visits Las Vegas again.

Rose was particularly moved, to tears, when this family won since the little boy had visited our both earlier in the day and had asked her a bunch of questions. He had just observed the sun through the Coronado hydrogen alpha telescopes and she wrote down the web address for [SpaceWeather.com](http://SpaceWeather.com) for him. He then asked how he could find out which planets would be up and when, and she gave him the link for the [Heavens Above](http://HeavensAbove.com) website and explained how to use it. I guess he approached us, figuring we were kid friendly, since we had astronomy themed coloring pages on our table and Robert's "Marvin the Martian" collectibles on a shelf.

Remember, next month's meeting (Friday October 14) is our Annual Business Meeting. Please come vote on the future of YOUR club. We still need nominations for officers, which may be submitted at [board@avastronomyclub.org](mailto:board@avastronomyclub.org) .

## Space Place

**Dark Clues to the Universe**

By Dr. Marc Rayman

Urban astronomers are always wishing for darker skies. But that complaint is due to light from Earth. What about the light coming from the night sky itself? When you think about it, why is the sky dark at all?

Of course, space appears dark at night because that is when our side of Earth faces away from the Sun. But what about all those other suns? Our own Milky Way galaxy contains over 200 billion stars, and the entire universe probably contains over 100 billion galaxies. You might suppose that that many stars would light up the night like daytime!

Until the 20th century, astronomers didn't think it was even possible to count all the stars in the universe. They thought the universe was infinite and unchanging.

Besides being very hard to imagine, the trouble with an infinite universe is that no matter where you look in the night sky, you should see a star. Stars should overlap each other in the sky like tree trunks in the middle of a very thick forest. But, if this were the case, the sky would be blazing with light. This problem greatly troubled astronomers and became known as "Olbers' Paradox" after the 19<sup>th</sup> century astronomer Heinrich Olbers who wrote about it, although he was not the first to raise this astronomical mystery.



*This Hubble Space Telescope image of Galaxy NGC 4414 was used to help calculate the expansion rate of the universe. The galaxy is about 60 million light-years away. Credit: NASA and The Hubble Heritage Team (STScI/AURA)*

To try to explain the paradox, some 19th century scientists thought that dust clouds between the stars must be absorbing a lot of the starlight so it wouldn't shine through to us. But later scientists realized that the dust itself would absorb so much energy from the starlight that eventually it would glow as hot and bright as the stars themselves.

Astronomers now realize that the universe is not infinite. A finite universe—that is, a universe of limited size—even one with trillions of stars, just wouldn't have enough stars to light up all of space.

Although the idea of a finite universe explains why Earth's sky is dark at night, other factors work to make it even darker.

The universe is expanding. As a result, the light that leaves a distant galaxy today will have much farther to travel to our eyes than the light that left it a million years ago or even one year ago. That means the amount of light energy reaching us from distant stars dwindles all the time. And the farther away the star, the less bright it will look to us.

Also, because space is expanding, the wavelengths of the light passing through it are expanding. Thus, the farther the light has traveled, the more red-shifted (and lower in energy) it becomes, perhaps red-shifting right out of the visible range. So, even darker skies prevail.

The universe, both finite in size and finite in age, is full of wonderful sights. See some bright, beautiful images of faraway galaxies against the blackness of space at the Space Place image galleries. Visit <http://spaceplace.nasa.gov/search/?q=gallery>.

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

## Comet Elenin and Other Fables by Paul Derrick

With my BA, MSW, and PhD degrees in the behavioral sciences, one would think I should have greater insight into a certain perplexing human behavior, one that overlaps with my avocational field of astronomy. In the two decades I've been writing "Stargazer" and presenting astronomy programs, I've been asked numerous times about "threats" to us and our planet, mostly relating to things from outer space. And though I do my best to allay such fears, some continue to accept uncritically what they read on the Internet.

One of the latest is Comet Elenin which, according to various Internet stories, might not be a comet at all but rather a "rogue planet" larger than Jupiter, or maybe a brown dwarf star which has entered our solar system. And it's going to rain all kinds of havoc on us Sept. 26, 2011 – or is October, or maybe November, or sometime in 2012? Depends on which crackpot you read.

Some claim it might crash into Earth. Others say even if misses, its gravitational pull will cause devastating earthquakes and tsunamis. And if that doesn't happen, then its powerful magnetic force will bring about changes in Earth's tilt, and perhaps even cause a pole shift. And why aren't we reading more about this in the mainstream media? Because there is a government conspiracy to keep it hushed lest the masses (that's us) panic.

Wow, that's a lot of worry about Comet Elenin which is, in fact, a small chunk of rocky ice less than 3 miles in diameter that will pass 21 million miles from Earth Oct. 16. The worry is all the more remarkable given the fact that Venus, which is close to Earth's size, regularly passes nearly that close to us, and nothing happens – no earthquakes, no tsunamis, no pole shifts – nothing beyond giving us a beautiful "evening star" or "morning star."

Elenin is just the most recent of such fables. Perhaps you've heard of Nibiru, Planet X, the aliens who crash-landed near Roswell, NM, or the 2012 Maya prophecy, to name but a few. And while I find no credible evidence to support any of these, I recognize that such stories hold a certain fascination – even for me.

As a teenager in the 1950s, I was captivated by amateur hypnotist Morey Bernstein's book *The Search for Bridey Murphy*, about the woman who under hypnosis was "proving" the existence of reincarnation by revealing information from her supposed previous lives. And there were the countless UFO "sightings" reported in the news that always made my ears perk up.

Then in the 1970s I was attracted to Erich Von Daniken's books, especially *Chariots of the Gods?* in which he set out to prove that many seemingly mysterious occurrences were the work of ancient astronauts thousands of years ago. But as much as I wanted to believe these things, they simply didn't hold up to critical scrutiny.

Most of the Internet-based fantasies in recent years seem to deal with threats to us and our planet – asteroids, comets, rogue planets or whatever on paths to destroy poor, hapless and helpless us.

That's not to say there is no chance of a large space object impacting Earth – it's happened many times before in Earth's history, and will certainly happen again, although probably not in our lifetime. There are efforts underway to find and track all near Earth objects (NEOs) that might pose a threat to Earth; to date none have been found that justify seriously worry. If and when any are found, it is unlikely our government, or any other, would try to keep it secret, or be able to if it tried.

Even though these Internet-fostered imagined threats can almost always be easily dispelled by scientific evidence, they still attract some folks like iron to a magnet. Many seem to want so strongly to believe them

that no evidence can budge their thinking, and my behavioral scientist self has trouble coming up with a satisfactory answer to “Why?”

Perhaps these stories simply entertain us, just as we're entertained by novels, movies, and science fiction – even when we know the stories aren't true. But that seems only a partial answer; it doesn't explain why many people apparently really want to, and do, believe these fictions.

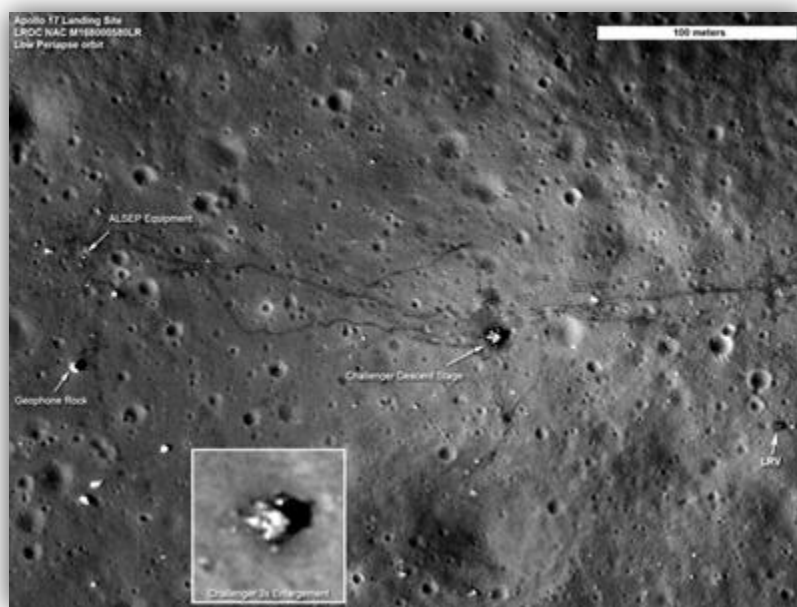
If they are attracted by ideas of drastic and dramatic threats to us and our planet, they need look no further than the many real threats we face, like our endless wars, or the tragic maldistribution of wealth, or our species' role in global warming, or our overpopulating, trashing, and depleting the finite resources of our planet. These are real horror stories, so why aren't there more Internet warnings about things that are truly threats to our well-being and survival. Why does there seem to be so much denial about these dangers?

Ah! Denial. Maybe that explains the curious behavior of our gullibility to fanciful dangers. Perhaps by dreaming up and preoccupying our thoughts with imagined threats, which deep in our subconscious we know or strongly suspect aren't real, it makes it easier to ignore those threats which, deep in our subconscious, we fear are real and which scare the living daylights out of us.

Maybe this explains our curious behavior, or maybe it doesn't, but there's no denying we'd be better off applying our mental energies and other resources to thinking about and dealing with real perils rather than imagined ones. That, of course, is a no-brainer, but how to make that happen – well, that's something else again. And while my college degrees still don't give me the satisfying answers I'd like, they helped me learn to think critically and inoculated me from the gullibility and magical thinking that afflict so many of our fellow sojourners on planet Earth.

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## Astrophoto of The Month



[This view of the Apollo 17](#) landing site in the Taurus-Littrow valley was captured last month by the Lunar Reconnaissance Orbiter (LRO), the sharpest ever [recorded from space](#). [The high resolution image](#) data was taken during a period when LRO's orbit was modified to create a close approach of about 22 kilometers as it passed over some of the Apollo landing sites. That altitude corresponds to only about twice the height of a commercial airline flight over planet Earth. Labeled in this image are Apollo 17 lunar lander [Challenger's](#) descent stage (inset), the [lunar rover](#) (LRV) at its final [parking spot](#), and the Apollo Lunar Surface Experiments Package (ALSEP) [left to monitor](#) the Moon's environment and interior. Clear,

dual lunar rover [tracks](#) and the foot trails left by astronauts [Eugene Cernan and Harrison Schmitt](#), the last to walk on the lunar surface, are also easily visible at the [Apollo 17 site](#).

## News Headlines

### Particles Found to Travel Faster than Speed of Light

An Italian experiment has unveiled evidence that fundamental particles known as neutrinos can travel faster than light. Other researchers are cautious about the result, but if it stands further scrutiny, the finding would overturn the most fundamental rule of modern physics—that nothing travels faster than 299,792,458 meters per second.

<http://www.scientificamerican.com/article.cfm?id=particles-found-to-travel>

### Fermi's Latest Gamma-ray Census Highlights Cosmic Mysteries

Every three hours, NASA's Fermi Gamma-ray Space Telescope scans the entire sky and deepens its portrait of the high-energy universe. Every year, the satellite's scientists reanalyze all of the data it has collected, exploiting updated analysis methods to tease out new sources. These relatively steady sources are in addition to the numerous transient events Fermi detects, such as gamma-ray bursts in the distant universe and flares from the sun.

[http://www.nasa.gov/mission\\_pages/GLAST/news/gamma-ray-census.html](http://www.nasa.gov/mission_pages/GLAST/news/gamma-ray-census.html)

### Invisible World Discovered

Usually, running five minutes late is a bad thing since you might lose your dinner reservation or miss out on tickets to the latest show. But when a planet runs five minutes late, astronomers get excited because it suggests that another world is nearby.

<http://www.cfa.harvard.edu/news/2011/pr201124.html>

### Construction Begin on Orion Flight Vehicle

Construction on the first space-bound Orion Multi-Purpose Crew Module has begun with the first weld at the Michoud Assembly Facility on Sept. 9. This capsule will be used during Orion's first test flight in space.

<http://www.spaceref.com/news/viewpr.html?pid=38347>

### UCSB Scientist Contributes to First Discovery of a Planet With Two 'Suns'

UC Santa Barbara astrophysicist Avi Shporer is part of the NASA team that has found the first known planet with two "suns," an idea popularized by the 1977 movie "Star Wars." The discovery is published this week in the journal Science.

<http://www.ia.ucsb.edu/pa/display.aspx?pkey=2561>

### Venus Weather Not Boring After All, NASA/International Study Shows

At first glance, a weather forecaster for Venus would have either a really easy or a really boring job, depending on your point of view. The climate on Venus is widely known to be unpleasant -- at the surface, the planet roasts at more than 800 degrees Fahrenheit under a suffocating blanket of sulfuric acid clouds and a crushing atmosphere more than 90 times the pressure of Earth's. Intrepid future explorers should abandon any hope for better days, however, because it won't change much.

<http://www.nasa.gov/topics/solarsystem/features/venus-temp20110926.html>

### New Supernova Remnant Lights Up

Using the Hubble Space Telescope, astronomers are witnessing the unprecedented transition of a supernova to a supernova remnant, where light from an exploding star in a neighboring galaxy, the Large Magellanic Cloud, reached Earth in February 1987. Named Supernova 1987A, it was the closest supernova explosion witnessed in almost 400 years.

<http://www.spaceref.com/news/viewpr.html?pid=34593>



## October Sky Data

**Best time for deep sky observing this month:  
October 19 through October 30**

**Mercury** was at superior conjunction – almost directly behind the Sun – on September 28th. Even at the end of October, it sets only a few minutes after sunset. We're unlikely to see this elusive little planet this month.

**Venus** too is setting only a few minutes after sunset. It will be well into the autumn before we start to get good views of the brilliant "Evening Star" again.

**Mars** is rising in the east around midnight, and it's well up in the south-east at dawn. Relative to the stars, the "Red Planet" is moving steadily south-eastwards, leaving the constellation of Cancer on October 19th and crossing into Leo. In the early morning of Friday October 21st, the waning Moon will appear to be to the right of Mars; the following morning, the Moon will appear directly below Mars.

**Jupiter** comes up in the east just after sunset; it's the only planet well-placed for viewing in the evenings this month. By the end of October, Jupiter is in opposition (to the Sun), so it rises at sunset and sets at sunrise. On the evening of Thursday October 13th, our own Moon, just past Full, will appear close to the upper left of Jupiter; by dawn on the 14th, the Moon will be directly above Jupiter.

**Saturn** is in superior conjunction (almost directly behind the Sun) on October 13th. We won't see the ringed planet at all this month.

The Orionid **meteor shower** is active every year during the second half of October; this year it will probably peak around Friday 21st. Unfortunately, this year the light from the waning Moon will tend to drown out the fainter meteors. A less well-known shower is the Draconids, which appear for only a few nights in early October. The radiant is in the constellation of Draco, not far from the bright star Vega. This year's peak is expected in the evening of Saturday October 8th. Some experts are predicting unusually high numbers of Draconids this year, but the light of the waxing gibbous Moon will drown out the fainter ones.

First Qtr Oct 3      Full Oct 11      Last Qtr Oct 19      New Oct 26



## Sun and Moon Rise and Set

Date	Moonrise	Moonset	Sunrise	Sunset
10/1/2011	11:44	21:53	06:46	18:35
10/5/2011	15:00	00:55	06:49	18:30
10/10/2011	17:30	05:40	06:53	18:23
10/15/2011	20:27	10:15	06:57	18:17
10/20/2011	00:08	14:07	07:01	18:11
10/25/2011	05:46	17:10	07:05	18:05
10/31/2011	12:16	22:44	07:11	17:59

## Planet Data

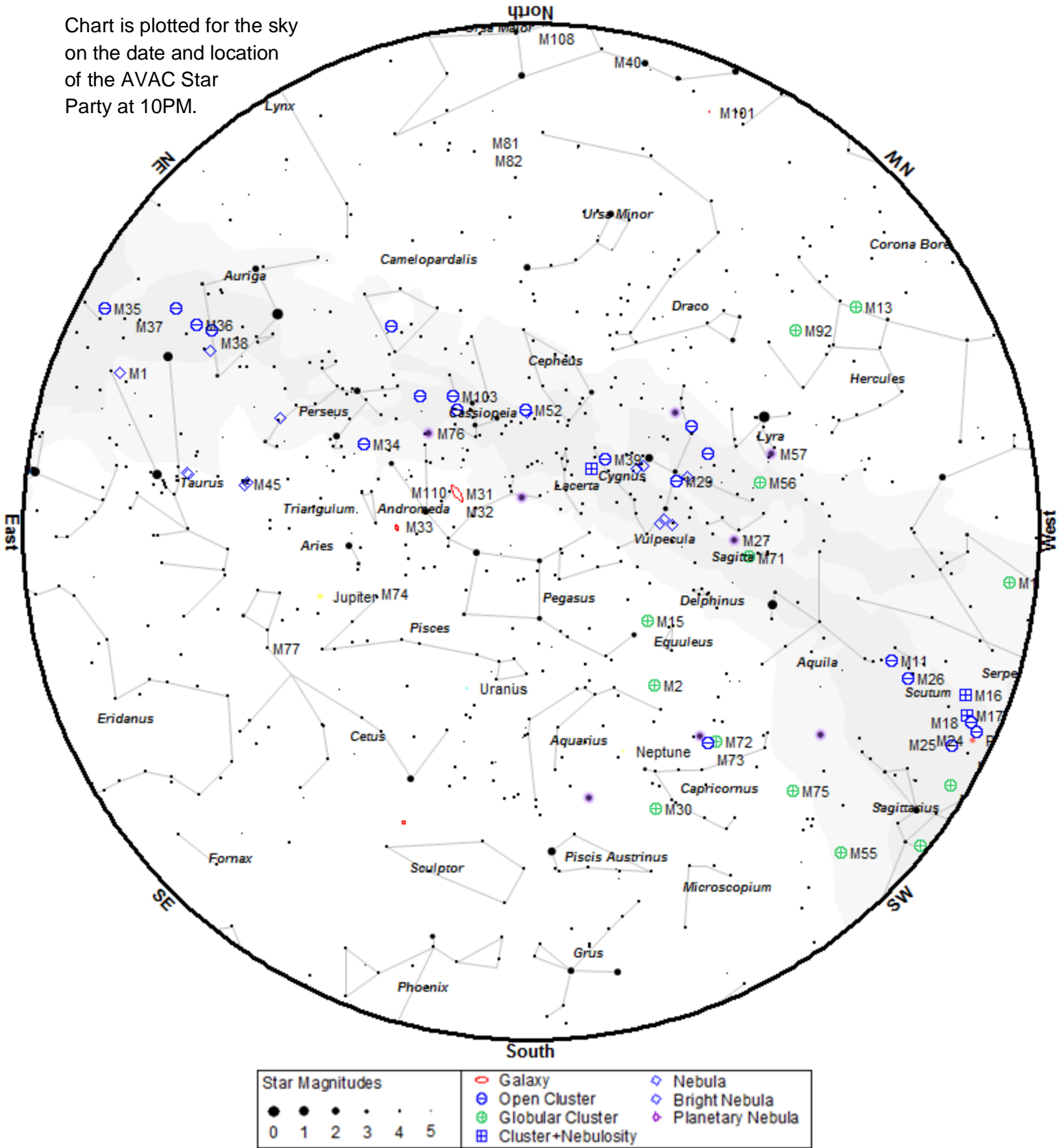
	Oct 1			
	Rise	Transit	Set	Mag
<b>Mercury</b>	06:57	12:57	18:59	-1.4
<b>Venus</b>	07:44	13:34	19:25	-3.9
<b>Mars</b>	01:47	08:56	16:07	1.3
<b>Jupiter</b>	19:53	02:40	09:28	-2.9
<b>Saturn</b>	07:29	13:28	19:24	0.8

	Oct 15			
	Rise	Transit	Set	Mag
<b>Mercury</b>	07:55	13:26	19:01	-0.5
<b>Venus</b>	08:14	13:45	19:17	-3.9
<b>Mars</b>	01:32	08:34	15:38	1.2
<b>Jupiter</b>	18:53	01:39	08:25	-2.9
<b>Saturn</b>	06:42	12:40	18:34	0.7

	Oct 31			
	Rise	Transit	Set	Mag
<b>Mercury</b>	08:50	13:56	19:05	-0.3
<b>Venus</b>	08:48	14:01	19:15	-3.9
<b>Mars</b>	01:12	08:06	15:02	1.1
<b>Jupiter</b>	17:44	00:28	07:12	-2.9
<b>Saturn</b>	05:48	11:40	17:36	0.7

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
NGC 6723	Glob	6.8	Sgr	18h59m33.0s	-36°37'54"	19:14	19:26	19:55	detectable
M 70	Glob	7.8	Sgr	18h43m13.0s	-32°17'30"	19:14	19:26	19:57	detectable
M 8	Neb	5.0	Sgr	18h04m02.0s	-24°23'14"	19:11	19:27	20:13	easy
M 21	Open	7.2	Sgr	18h04m13.0s	-22°29'24"	19:14	19:28	20:02	detectable
M 20	Open	5.2	Sgr	18h02m42.0s	-22°58'18"	19:12	19:28	20:12	easy
M 28	Glob	6.9	Sgr	18h24m33.0s	-24°52'12"	19:14	19:28	20:06	detectable
M 23	Open	5.9	Sgr	17h57m04.0s	-18°59'06"	19:15	19:29	20:07	detectable
M 54	Glob	7.7	Sgr	18h55m03.0s	-30°28'42"	19:16	19:29	19:58	detectable
M 17	Open	7.3	Sgr	18h20m47.0s	-16°10'18"	19:18	19:30	20:05	detectable
M 18	Open	7.5	Sgr	18h19m58.0s	-17°06'06"	19:10	19:30	20:42	easy
M 25	Open	6.2	Sgr	18h31m47.0s	-19°07'00"	19:14	19:30	20:22	detectable
M 22	Glob	5.2	Sgr	18h36m24.0s	-23°54'12"	19:14	19:30	20:18	detectable
M 14	Glob	7.6	Oph	17h37m36.0s	-03°14'48"	19:17	19:31	19:45	detectable
M 16	Open	6.5	Ser	18h18m48.0s	-13°48'24"	19:09	19:31	19:37	obvious
NGC 6572	PNe	8.0	Oph	18h12m06.4s	+06°51'12"	19:02	19:31	20:53	obvious
NGC 6716	Open	7.5	Sgr	18h54m34.0s	-19°54'06"	19:14	19:32	20:42	detectable
M 13	Glob	5.8	Her	16h41m41.0s	+36°27'36"	19:14	19:32	20:31	easy
IC 4665	Open	5.3	Oph	17h46m18.0s	+05°43'00"	19:18	19:32	20:22	detectable
M 55	Glob	6.3	Sgr	19h40m00.0s	-30°57'42"	19:14	19:32	20:35	detectable
M 92	Glob	6.5	Her	17h17m07.0s	+43°08'12"	19:14	19:33	21:21	easy
NGC 6633	Open	5.6	Oph	18h27m15.0s	+06°30'30"	19:12	19:33	21:06	easy
M 11	Open	6.1	Sct	18h51m05.0s	-06°16'12"	19:14	19:33	20:46	detectable
IC 4756	Open	5.4	Ser	18h39m00.0s	+05°27'00"	19:14	19:34	21:12	easy
NGC 6818	PNe	10.0	Sgr	19h43m57.8s	-14°09'12"	19:07	19:34	20:59	easy
NGC 6543	PNe	8.3	Dra	17h58m33.4s	+66°37'59"	19:03	19:36	22:59	obvious
M 57	PNe	9.4	Lyr	18h53m35.1s	+33°01'45"	19:10	19:36	22:36	easy
M 24	Open	11.1	Sgr	18h18m26.0s	-18°24'24"	19:16	19:36	20:51	very challenging
M 56	Glob	8.4	Lyr	19h16m36.0s	+30°11'06"	19:15	19:37	21:49	detectable
M 27	PNe	7.3	Vul	19h59m36.3s	+22°43'16"	19:12	19:39	22:57	easy
M 71	Glob	8.4	Sge	19h53m46.0s	+18°46'42"	19:12	19:39	22:45	easy
NGC 6871	Open	5.8	Cyg	20h05m59.0s	+35°46'36"	19:11	19:40	23:20	easy
NGC 6910	Open	7.3	Cyg	20h23m12.0s	+40°46'42"	19:09	19:42	23:54	easy
M 29	Open	7.5	Cyg	20h23m57.0s	+38°30'30"	19:11	19:42	23:43	easy
NGC 7009	PNe	8.3	Aqr	21h04m10.9s	-11°21'48"	19:03	19:53	22:35	obvious
M 15	Glob	6.3	Peg	21h29m58.0s	+12°10'00"	19:13	20:17	23:56	easy
M 39	Open	5.3	Cyg	21h31m48.0s	+48°26'00"	19:10	20:19	01:25	easy
M 2	Glob	6.6	Aqr	21h33m27.0s	-00°49'24"	19:13	20:21	23:31	detectable
M 30	Glob	6.9	Cap	21h40m22.0s	-23°10'42"	19:17	20:27	21:38	detectable

ID	Cls	Mag	Con	RA 2000	Dec 2000	Begin	Best	End	Difficulty
IC 1396	Neb		Cep	21h39m06.0s	+57°30'00"	19:14	20:31	02:21	very challenging
NGC 7160	Open	6.4	Cep	21h53m40.0s	+62°36'12"	19:06	20:41	02:42	obvious
Cocoon Neb.	Neb	10.0	Cyg	21h53m24.0s	+47°16'00"	19:15	20:46	02:01	very challenging
NGC 7243	Open	6.7	Lac	22h15m08.0s	+49°53'54"	19:14	21:02	01:14	detectable
NGC 7293	PNe	6.3	Aqr	22h29m38.5s	-20°50'14"	19:38	21:17	22:55	detectable
M 52	Open	8.2	Cas	23h24m48.0s	+61°35'36"	19:19	22:12	02:21	detectable
NGC 7789	Open	7.5	Cas	23h57m24.0s	+56°42'30"	19:23	22:44	02:34	detectable
NGC 7790	Open	7.2	Cas	23h58m24.0s	+61°12'30"	19:09	22:46	04:43	obvious
NGC 55	Gal	8.5	Scl	00h15m08.4s	-39°13'13"	21:57	23:02	00:06	difficult
M 110	Gal	8.9	And	00h40m22.3s	+41°41'09"	19:39	23:27	03:17	detectable
M 31	Gal	4.3	And	00h42m44.3s	+41°16'07"	19:19	23:30	03:59	easy
M 32	Gal	8.9	And	00h42m41.8s	+40°51'58"	19:19	23:30	03:57	easy
NGC 253	Gal	7.9	Scl	00h47m33.1s	-25°17'20"	23:09	23:34	00:00	detectable
NGC 288	Glob	8.1	Scl	00h52m45.0s	-26°35'00"	22:11	23:40	01:09	difficult
NGC 457	Open	5.1	Cas	01h19m35.0s	+58°17'12"	19:13	00:07	05:51	obvious
NGC 559	Open	7.4	Cas	01h29m31.0s	+63°18'24"	19:14	00:17	05:53	easy
M 103	Open	6.9	Cas	01h33m23.0s	+60°39'00"	19:12	00:20	05:58	obvious
M 33	Gal	6.4	Tri	01h33m50.9s	+30°39'36"	20:29	00:20	04:03	detectable
M 76	PNe	10.1	Per	01h42m19.9s	+51°34'31"	20:17	00:29	04:32	detectable
NGC 637	Open	7.3	Cas	01h43m04.0s	+64°02'24"	19:10	00:30	06:01	obvious
NGC 663	Open	6.4	Cas	01h46m09.0s	+61°14'06"	19:17	00:33	05:53	easy
NGC 752	Open	6.6	And	01h57m41.0s	+37°47'06"	22:17	00:44	03:11	challenging
NGC 869	Open	4.3	Per	02h19m00.0s	+57°07'42"	19:20	01:06	06:01	obvious
NGC 884	Open	4.4	Per	02h22m18.0s	+57°08'12"	19:23	01:09	06:00	obvious
NGC 957	Open	7.2	Per	02h33m21.0s	+57°33'36"	19:51	01:20	05:55	easy
Heart Neb.	Neb	6.5	Cas	02h33m52.0s	+61°26'50"	22:38	01:26	03:55	challenging
NGC 1027	Open	7.4	Cas	02h42m40.0s	+61°35'42"	20:58	01:29	05:43	detectable
M 34	Open	5.8	Per	02h42m05.0s	+42°45'42"	21:03	01:29	05:43	easy
M 77	Gal	9.7	Cet	02h42m40.8s	-00°00'48"	22:23	01:29	04:28	detectable
NGC 1245	Open	7.7	Per	03h14m42.0s	+47°14'12"	23:32	02:07	04:26	challenging
NGC 1342	Open	7.2	Per	03h31m38.0s	+37°22'36"	22:02	02:18	05:55	easy
M 45	Open	1.5	Tau	03h47m00.0s	+24°07'00"	21:57	02:33	06:02	obvious
NGC 1444	Open	6.4	Per	03h49m25.0s	+52°39'30"	20:59	02:36	06:05	obvious
NGC 1502	Open	4.1	Cam	04h07m50.0s	+62°19'54"	20:55	02:54	06:07	obvious
NGC 1528	Open	6.4	Per	04h15m23.0s	+51°12'54"	21:52	03:02	06:00	easy
Hyades	Open	0.8	Tau	04h26m54.0s	+15°52'00"	22:59	03:13	06:00	easy
M 38	Open	6.8	Aur	05h28m40.0s	+35°50'54"	00:02	03:25	06:00	detectable
M 42	Neb	4.0	Ori	05h35m18.0s	-05°23'00"	01:11	03:25	06:02	easy
NGC 1664	Open	7.2	Aur	04h51m06.0s	+43°40'30"	22:40	03:26	06:01	easy
M 36	Open	6.5	Aur	05h36m18.0s	+34°08'24"	23:27	03:26	06:03	easy
NGC 1746	Open	6.1	Tau	05h03m50.0s	+23°46'12"	00:18	03:26	05:57	detectable
NGC 1647	Open	6.2	Tau	04h45m55.0s	+19°06'54"	00:08	03:26	05:55	detectable
M 1	Neb	8.4	Tau	05h34m30.0s	+22°01'00"	02:05	03:31	05:56	challenging
NGC 1851	Glob	7.1	Col	05h14m06.0s	-40°02'48"	02:42	04:02	05:14	detectable
M 43	Neb	9.0	Ori	05h35m30.0s	-05°16'00"	01:17	04:31	06:07	challenging

ID	Cls	Mag	Con	RA 2000	Dec 2000	Begin	Best	End	Difficulty
IC 434	Neb	11.0	Ori	05h41m00.0s	-02°27'00"	01:11	04:36	06:07	very challenging
M 78	Neb	8.0	Ori	05h46m48.0s	+00°05'00"	02:46	04:41	05:54	challenging
M 37	Open	6.2	Aur	05h52m18.0s	+32°33'12"	23:51	04:46	06:04	easy
NGC 2129	Open	7.0	Gem	06h01m07.0s	+23°19'20"	00:14	04:52	06:04	obvious
NGC 2169	Open	7.0	Ori	06h08m24.0s	+13°57'54"	00:43	04:59	06:05	obvious
M 35	Open	5.6	Gem	06h09m00.0s	+24°21'00"	00:33	05:00	06:03	easy
NGC 2175	Open	6.8	Ori	06h09m39.0s	+20°29'12"	01:11	05:00	06:00	detectable
NGC 2264	Open	4.1	Mon	06h40m58.0s	+09°53'42"	01:26	05:23	06:02	obvious
NGC 2237	Neb	5.5	Mon	06h32m02.0s	+04°59'10"	03:22	05:23	05:58	challenging
M 41	Open	5.0	CMa	06h46m01.0s	-20°45'24"	03:53	05:26	05:59	easy
NGC 2301	Open	6.3	Mon	06h51m45.0s	+00°27'36"	02:06	05:27	06:02	easy
M 50	Open	7.2	Mon	07h02m42.0s	-08°23'00"	02:51	05:30	05:59	detectable
NGC 2355	Open	9.7	Gem	07h16m59.0s	+13°45'00"	03:08	05:32	05:55	difficult
NGC 2353	Open	5.2	Mon	07h14m30.0s	-10°16'00"	03:13	05:32	06:03	easy
NGC 2392	PNe	8.6	Gem	07h29m10.8s	+20°54'42"	01:47	05:33	06:08	obvious
M 82	Gal	9.0	UMa	09h55m52.4s	+69°40'47"	02:18	05:36	05:59	easy
M 81	Gal	7.8	UMa	09h55m33.1s	+69°03'56"	02:20	05:36	05:59	detectable
NGC 2423	Open	7.0	Pup	07h37m06.0s	-13°52'18"	03:53	05:36	06:01	easy
M 47	Open	4.3	Pup	07h36m35.0s	-14°29'00"	03:57	05:35	06:03	obvious
M 46	Open	6.6	Pup	07h41m46.0s	-14°48'36"	04:03	05:36	05:59	detectable
M 44	Open	3.9	Cnc	08h40m24.0s	+19°40'00"	03:04	05:37	06:00	easy
NGC 2506	Open	8.9	Mon	08h00m01.0s	-10°46'12"	04:34	05:37	05:54	difficult
NGC 2440	PNe	11.5	Pup	07h41m55.4s	-18°12'31"	04:27	05:37	05:57	detectable
M 67	Open	7.4	Cnc	08h51m18.0s	+11°48'00"	04:18	05:38	05:55	detectable
M 93	Open	6.5	Pup	07h44m30.0s	-23°51'24"	05:31	05:38	06:01	easy
NGC 2393	Gal	14.6	Gem	07h30m04.6s	+34°01'40"	01:23	05:39	06:12	not visible
NGC 2360	Open	9.1	CMa	07h17m43.0s	-15°38'30"	04:25	05:39	05:59	challenging
NGC 2439	Open	7.1	Pup	07h40m45.0s	-31°41'36"	04:10	05:39	06:01	easy
NGC 3227	Gal	11.5	Leo	10h23m30.6s	+19°51'54"	05:00	05:40	05:54	difficult
NGC 2451	Open	3.7	Pup	07h45m23.0s	-37°57'21"	04:31	05:41	06:03	easy
M 106	Gal	9.1	CVn	12h18m57.6s	+47°18'13"	05:39	05:42	05:56	detectable
NGC 2571	Open	7.4	Pup	08h18m56.0s	-29°45'00"	04:32	05:42	06:00	easy
NGC 2477	Open	5.7	Pup	07h52m10.0s	-38°31'48"	04:37	05:43	06:03	easy
NGC 2546	Open	5.2	Pup	08h12m15.0s	-37°35'42"	05:23	05:44	05:54	difficult
M 97	PNe	11.0	UMa	11h14m47.7s	+55°01'09"	04:21	05:45	06:08	challenging
NGC 2547	Open	5.0	Vel	08h10m09.0s	-49°12'54"	05:31	05:56	06:09	detectable

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