ANTELOPE VALLEY ASTRONOMY CLUB, INC.

Desert Sky Observer

Volume 29 | **Antelope Valley Astronomy Club Newsletter** | **September 2009**

Up-Coming Events

September	**11:** Club meeting @ the Sage Planetarium*
September	**12:** Moonwalk with Jeremy @ Prime Desert Woodlands
September	**14:** Executive Board Meeting @ Don's house
September	**19:** Mt. Wilson Trip
September	**26:** Lunar Club & BBQ, 5 PM @ Matt Leone's
September	**26-27:** PATS @ the Pasadena Convention Center

* 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

It's nearly that time again. At the October business meeting, we will elect a new board and vote on any changes to our constitution and by-laws. Additionally, your current board members will be voting on changes to the operations manual and deciding whether or not to promote the Long Range Planning Committee to be a standing committee. You can review these proposals at http://www.avastronomyclub.org/docs/Ops_Man_09.pdf. Please consider nominating someone for a board position. Or, toss your own hat in the ring. It's your club and your hobby and serving on the board or a committee can be very rewarding.

In November our Awards Committee will decide on a recipient for the Keith Lawson award as well as the Holland Fountain award. Please use the links on our homepage to send in your nominations. The committee makes its mind up in November in order to get the plaques engraved in time for their presentation at the Christmas party.

With all this club business it would seem there's no time for observing! There are still some great upcoming opportunities, starting off with a Lunar club/Prime Desert Moonwalk on the 29th. September follows with another PDW on the 12th. The Mt. Wilson trip is the next weekend. For those lucky 25 participants, be sure to pay by the 12th and then watch the website and your email for directions on where and when to meet. PATS follows the next weekend. If you didn't make it to RTMC then PATS is a great opportunity to see the latest and greatest from all sorts of vendors, not to mention the great raffles and freebies. If you don't stay down in Pasadena then come out to Matt Leone's for a BBQ and Lunar club on Saturday the 26th, then it's back to Pasadena and PATS for Sunday the 27th.

Be on the lookout for another series of mirror making master classes at Matt's shop and we're even thinking of getting a group together to meet at my house where we will plan and build a truss dob telescope.

Finally, don't forget about our monthly meetings. In September, come hear Doug Drake give a fascinating talk on cosmology. And in November, Jeremy and Matt have a very entertaining evening planned with a presentation on Messier's famous objects.

Clear Skies!

Vice President

Rose Moore

Our schedule for the upcoming club meetings are as follows: Doug Drake will do a talk on 'Cosmology' (no Don, not 'Cosmetology'!), for September's meeting. October is our annual business meeting. Please come out to vote on whom you want for our club officers for 2010!! We need your support and input! We usually have a small turnout for this meeting, let's make this year different, and come out and support our awesome astronomy club!!

November will be Matt Leone's and Jeremy Amarant's talk and Planetarium show on the Messier Objects! This should be a wonderful presentation on objects that we all know and love to observe!

There is no club meeting for December, but we will be having our annual club Christmas Party on Saturday, Dec. 12th at 6 PM, at the Antelope Valley Inn. The Inn is located on Sierra Highway in Lancaster. We will have more information as the date gets closer. If you have any items to donate for our raffle or auction, please contact me or another board member this fall.

Thanks to all our club members for attending our club picnic this past weekend! You made it a big success, again!! Thank you all for donating food items, non perishables, ice, tables, and items for the raffle and auction!! And a BIG thanks to Steve Trotta and family for sharing their home and space with a bunch of rowdy amateur astronomers!!

Clear dark skies!

Director of Community Development

Karole Barker

The turnout for Prime Desert Woodlands on July 25th was great. We had 115 people show up for the event, in addition to 11 club members. The next three Prime Desert Woodlands will be held on August 29th @ 8:00 p.m., this is also going to be a Lunar Club event. Any questions, in regard to the Lunar Club please contact Matt Leone. The other dates for Prime Desert Woodlands with Jeremy are September 12th @ 7:30 p.m., October 10th @ 7:00 p.m. and November 14th @ 6:00 p.m. We still need volunteers to bring out scopes those nights. Please let me know if you can make it.

Our club is confirmed for a 1/2 night at Mt. Wilson on Saturday September 19th. The cost for the night is $900.00. We have 25 people going, so the cost will be $36.00 per person. Those club members who have signed up, the cost per person is going to be $36.00. Please make checks payable to the club and either pay Tom Koonce or myself. We need the funds in before September 12th, which is the next club meeting.

Another big event in September will at PATS @ the Pasadena Convention Center on September 26th & 27th.

The Lunar club will be meeting on Saturday September 26th @ 7:00 p.m. with Matt Leone.

Clear skies!

Extraterrestrial Tidbits by Jeff Riechmann

When it comes to getting smashed with the Moon, practice makes perfect! On 9 October 2009, NASA will have the LCROSS satellite impact the southern polar region of our original satellite, the Moon, at around 0430 hours local time. (Plans are currently being organized for a special star party to watch this historic event take place.) This is not the first time that the US has sent something crashing into the Moon on purpose.

In 1961, the first of nine Ranger missions were launched. The first two, Ranger 1 and Ranger 2, were intended for earth orbit as part of the testing process but never even got that far when their launch vehicles failed. Ranger 3 missed its target; I guess the Moon isn't really that big after all! Ranger 4, which was damaged during launch, impacted the Moon but was unable to send back any data. Yes, Ranger 4 was damaged before it was destroyed! Ranger 5 was disabled during launch and missed the Moon -- again. Ranger 6 was a beautiful flight, except that none of its cameras worked! Ranger 7 impacted just south of Copernicus crater on July 31, 1964. Ranger 8 smashed into the Sea of Tranquility, which probably wasn't very tranquil when that happened! And the last Ranger mission, Ranger 9 augured in at Alphonsus crater.

In 1966, NASA would launch the first of five Lunar Orbiters. The last of these, Lunar Orbiter 5, was a smashing success when it crashed into the Moon on January 31, 1968.

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

Vandenberg Launch Schedule: As of 2009 August 15

Date	Launch Time/Window (PST/PDT)	Vehicle	Pad/Silo
OCT 6	~11:35	Delta II	SLC-2W
Payload is the WorldView-2 commercial reconnaissance satellite.			
OCT 22	Evening	Minotaur IV	SLC-8
First-ever Minotaur IV launch. Payload is the Space-Based Space Surveillance (SBSS) satellite.			
NET DEC 10	To be announced	Delta II	SLC-2W
Payload is the WISE scientific satellite.			
NET APR 1	To be announced	Taurus	576-E
Payload is the Glory scientific satellite.			
Unk	09:12	Atlas V	SLC-3
Payload is the DMSP F18 military weather satellite.			

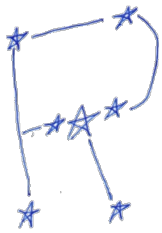
JEFF'S REPORT:

- Membership in the Aerospace Committee is open to any active member of the Antelope Valley Astronomy Club, especially those with an interest in rocket ships!

- LCROSS and LRO launched on Thursday, June 18 @ 5:32 PM Eastern Time. Projected Impact at the lunar South Pole: **Oct 9, 11:30 UT (7:30 EDT, 4:30 PDT) Stand-by for information on the upcoming *special* star-party!**
- Those of you interested in Near-Earth Objects (NEO) should check out the JPL website "Asteroid Watch" at www.jpl.nasa.gov/asteroidwatch. Speaking of NEO, there is a rumor circulating that the Astronomy Dudes could be putting on a special presentation on NEOs sometime in the not too distant future.

ROSWELL'S REPORT:

Greetings to all earthlings from Belluckleonia (or as you pronounce it, Belt Buckle)! I've been enjoying summer here on earth as it is much cooler than the summers on my home planet. But you want to talk about hot? I remember this one summer a couple of years ago; I was cruising around your solar system in this brand new 2008 **B**elluckleonian **E**xtraterrestrial **E**scape **R**ocket (BEER), sportster model, when I decided to stop off for a potty break on Mercury. Man, now that place is hot! Anyway, I've actually started receiving fan mail from some of your fellow earthlings. Be sure to check out the book with all of the fan mail I have received in it at the next club meeting.



Roswell

Space Place - A Planet Named Easterbunny?

You know Uranus, Neptune, and Pluto. But how about their smaller cousins Eris, Ceres, Orcus, and Makemake? How about Easterbunny?

These are all names given to relatively large "planet-like" objects recently found in the outer reaches of our solar system. Some were just temporary nicknames, others are now official and permanent. Each has a unique story. "The names we chose are important," says Caltech astronomer Mike Brown, who had a hand in many of the discoveries. "These objects are a part of our solar system; they're in our neighborhood. We 'gravitate' to them more if they have real names, instead of technical names like 2003 UB313."

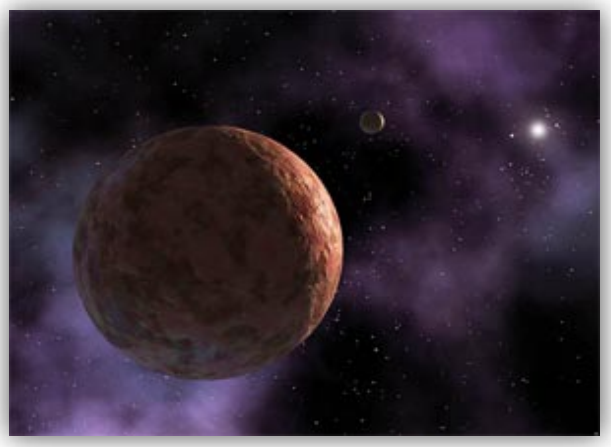
Nearby planets such as Venus and Mars have been known since antiquity and were named by the ancient Romans after their gods. In modern times, though, who gets to name newly discovered dwarf planets and other important solar-system bodies?

In short, whoever finds it names it. For example, a few days after Easter 2005, Brown and his colleagues discovered a bright dwarf planet orbiting in the Kuiper belt. The team's informal nickname for this new object quickly became Easterbunny.

However, ever since its formation in 1919, the International Astronomical Union (IAU) ultimately decides whether to accept or reject the name suggested by an object's discoverers. "Easterbunny" probably wouldn't be approved.

According to IAU guidelines, comets are named after whoever discovered them—such as comet Hale-Bopp, named after its discoverers Alan Hale and Thomas Bopp. Asteroids can be named almost anything. IAU rules state that objects in the Kuiper belt should be given mythological names related to creation.

So Brown's team started brainstorming. They considered several Easter-esque names: Eostre, the pagan mythological figure that may be Easter's namesake; Manabozho, the Algonquin rabbit trickster god.



Artist's rendering of dwarf planet MakeMak, discovered around Easter 2005.

In the end, they settled on Makemake (pronounced MAH-kay MAH-kay), the creator of humanity in the mythology of Easter Island, so named because Europeans first arrived there on Easter 1722. Other names have other rationales. The dwarf planet discovered in 2005 that triggered a fierce debate over Pluto's status was named Eris, for the Greek goddess of strife and discord. Another dwarf planet with an orbit that mirrors Pluto's was dubbed Orcus, a god in Etruscan mythology that, like Pluto, ruled the underworld.

Brown says he takes "this naming business" very seriously and probably spends too much time on it. "But I enjoy it." More tales of discovery and naming may be found in Brown's blog MikeBrownsPlanets.com.

Constellations have also been named after ancient gods, human figures, and animals. Kids can start to learn their constellations by making a Star Finder for this month at: http://spaceplace.nasa.gov/en/kids/st6starfinder/st6starfinder.shtml. There you will also find a handy explanation of why astrology has no place in science.

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

Observe Pluto This Year! by Tom Koonce

How many planets have you observed? How many minor planets and dwarf planets? Even though this month's IYA theme is "Planets and Moons" our new Dwarf Planet, Pluto, offers an interesting challenge. Let's not debate the terms "Planet" or "Dwarf Planet", but instead ask if you have you ever observed faint Pluto? It's a difficult object to see and to verify.

Pluto can be observed through an 8" telescope, but in my opinion it is HARD to do for an intermediate-level observer. In Greek mythology, Pluto was named after Hades, the God of the underworld, and you'll think about sending this challenge to the same location, but stick with it because spotting Pluto on your own for the first time is an extremely rewarding experience.

You need exceptionally dark skies, a decent telescope and a lot of patience! There is an equation to help you work out how far down the magnitude scale you can get with a telescope (Remember big magnitudes = fainter objects):

Telescope Limiting Magnitude = (Visual Limiting Magnitude) – (5*log d) + (5*log D)

where d is the aperture of the human eye in meters and D is the aperture of the telescope in meters.

So to give some examples, let's consider a normal sky where the visual limit is around Magnitude 4.5 and using a 3-inch (76 mm) refractor telescope. We'll use 6 mm as an example aperture of the dark-adapted human eye (young eyes can get to 7 mm):

Telescope Limiting Magnitude = 4.5 – (5*log(0.006)) + (5*log(0.076)) = 10.0

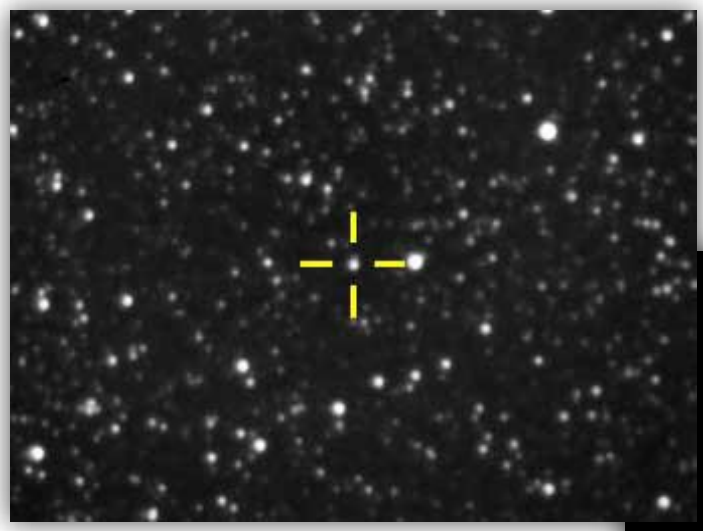
So with a small refractor you can theoretically see down to a limit of about Magnitude 10.0 under these conditions. Pluto however is at Magnitude 13.8 so this is well out of the range of such a small telescope. Under very good skies with a limiting Magnitude of 7.0 and using a telescope of 10 inches (254 mm) aperture, the limiting magnitude becomes.

Telescope Limiting Magnitude = 7.0 – (5*log(0.006)) + (5*log(0.254)) = 15.1

This puts Pluto easily into "realistically observable" status. Why not set the goal of observing all the planets, and Pluto – just for fun?

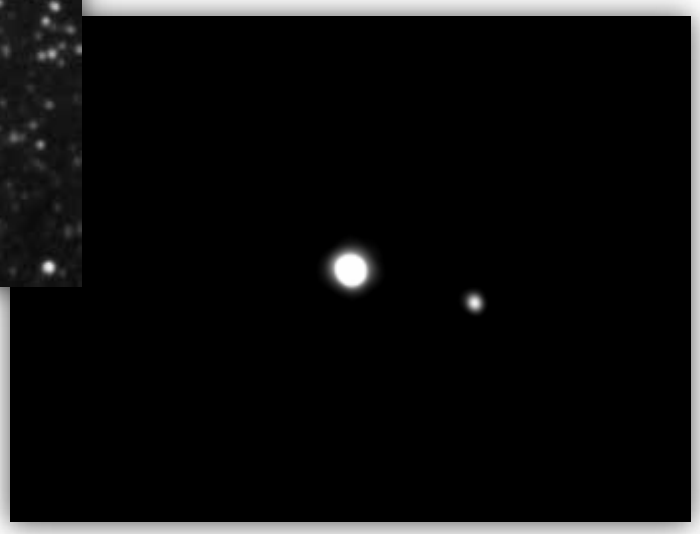
Depending upon the type of telescope you have and if you have astrophotography skill, you may choose to image Pluto instead of working on the drawing recommended here. Either way you'll have to know where to look. It's recommended that you determine (and memorize) the field of view that you will use during your observation. You can utilize the "12DString FOV Calculator" online here: (http://www.12dstring.me.uk/fov.htm) to help figure out the field of view you will see in the eyepiece. You can use a Go-To scope or you can star-hop to the location of Pluto. Either way you must use your telescopes' clock drive to keep the field around the suspected position of Pluto and carefully draw the field of stars. It is critical to spend a lot of time making this drawing because you'll use it over the next two nights to determine which of the faint dots of light is moving and which are static. Fixed = background stars… moving = Pluto!

You will see something like this in your eyepiece:



Amateur astronomer Chris Peterson, 12-inch telescope, Cloudbait Observatory, Guffey, CO

NOT something like this:



International Year of Astronomy - Planets and Moons

Galileo's telescopic discoveries shook the foundations of the cosmology handed down from the ancients. He observed sunspots, the rugged surface of the Moon, and perhaps most profoundly, bright Jupiter and what appeared to be four small companion bodies (right). He noticed that these four objects were lined up and that they changed positions over time. Galileo realized that the four satellites were orbiting Jupiter, directly contradicting the older idea that Earth is the center of motion for all heavenly bodies. You can see this bright planet in the night sky this month. See the Finder Chart in this Guide to find out where to look for it.

Of course, we now know that the planets of the Solar System orbit the Sun, not Earth, and all the planets except for the two closest to the Sun have at least one moon to keep them company. In fact, there are 144 known planetary moons, with at least 21 more awaiting official recognition. Telescopes have improved considerably since Galileo's time, growing larger and more sophisticated. Because Earth's atmosphere interferes with observations, NASA sent telescopes into orbit around the Earth, including the Hubble Space Telescope and later the infrared Spitzer Space Telescope. NASA increased our observational powers with spacecraft sent to all eight planets as well as to many moons, asteroids, and comets. Galileo would be quite surprised to learn that humans have explored and walked upon Earth's Moon, even bringing back moon rocks for study.

What we know about the Solar System has increased dramatically in just the last few decades. One of the spacecraft that changed the way we look at the planets and moons was named after Galileo. The Galileo spacecraft was the first to fly past an asteroid and the first to discover a moon of an asteroid. It provided direct observations of a comet colliding with a planet. It was the first to measure Jupiter's atmosphere with a descent probe and the first to conduct long-term observations of the Jovian system from orbit. The moons of Jupiter reflect the great diversity of moons throughout the solar system - Io is the most volcanically active body in the entire solar system, and evidence supports the presence of a hidden subsurface ocean of water on Europa.

Our journey of discovery has just begun. Cassini-Huygens, in orbit at Saturn, is imaging the rings and moons and unveiling methane lakes below the clouds of the moon Titan. The Mars Exploration Rovers and the Phoenix Lander have researched the terrain and soil of Mars. And there will likely be more surprises waiting. The Messenger spacecraft passes by Mercury this month and will settle into orbit in 2011 to conduct extensive studies of this innermost planet. The LRO and LCROSS missions will map the surface and look for water ice on our own Moon. NASA spacecraft travel even to the most distant places — use the attached activity to find out why it will take the New Horizons mission a decade to reach the outer edge of our Solar System.

News Headlines

NASA Researchers Make First Discovery of Life's Building Block in Comet
NASA scientists have discovered glycine, a fundamental building block of life, in samples of comet Wild 2 returned by NASA's Stardust spacecraft. "Glycine is an amino acid used by living organisms to make proteins, and this is the first time an amino acid has been found in a comet," said Dr. Jamie.
http://www.nasa.gov/mission_pages/stardust/news/stardust_amino_acid.html

Jupiter Without Moons
On the night of September 2-3, 2009, a remarkable celestial event will take place. From 4:43 to 6:29 Universal Time on the 3rd (which is 12:43 to 2:29 a.m. EDT on the 3rd, or 9:43 to 11:29 p.m PDT on the 2nd), a casual look at Jupiter through a telescope will show no moons at all. It's quite common for one of the four Galilean moons be hidden, and it's not rare to see only two moons. But only a few times in a century do all four moons hide simultaneously behind or in front of Jupiter.
http://www.skyandtelescope.com/observing/highlights/52543517.html

Planetary Smash-Up Leaves Ring Around Star
Vaporized remains of rock and lava circle a very young star, creating a ring of debris scientists believe formed after a violent crash of two planetary bodies. The host star is HD 172555, located about 100 light-years away in the southern constellation Pavo, or Peacock.
http://dsc.discovery.com/news/2009/08/13/planetary-crash.html

Extrasolar Hot Jupiter: The Planet That 'Shouldn't Exist'
A planet has been discovered with ten times the mass of Jupiter, but which orbits its star in less than one Earth-day. The discovery, reported in this week's Nature by Coel Hellier, of Keele University in the UK, and colleagues, poses a challenge to our understanding of tidal interactions in planetary systems.
http://www.sciencedaily.com/releases/2009/08/090827132901.htm

Chandra Turns Ten
About ten years ago Space Shuttle Columbia launched hauling 55,000 pounds worth of astronomers' dreams -- the Chandra X-Ray Observatory. This was the heaviest payload a space shuttle ever lifted – and one of the best day's labor the work-horse space shuttle ever put in.
http://science.nasa.gov/headlines/y2009/19aug_chandra10.htm

Rewriting General Relativity? Putting A New Model Of Quantum Gravity Under The Microscope
Does an exciting but controversial new model of quantum gravity reproduce Einstein's theory of general relativity? Scientists at Texas A&M University in the US explore this question in a paper appearing in Physical Review Letters and highlighted with a Viewpoint in the August 24th issue of Physics.
http://www.sciencedaily.com/releases/2009/08/090824115758.htm

Giant Star Boils, Releasing Matter Into Space
Astronomers have long been curious how red supergiants stars, like the bright star, Betelgeuse, manage to shed so much matter into space. Now, thanks to a collaborative effort which gave scientists a detailed view of the distant star's surface, they have an answer -- it's boiling.
http://dsc.discovery.com/news/2009/08/03/boiling-star.html

Equipment Review - The Galileoscope In Action by Tom Koonce

When I first heard about the Galileoscope project which seeks to get a 'good' telescope into people's hands for $20, I was, to say the least, a bit dubious about their claims. I wasn't expecting much, but for $20 and an acknowledged addiction to telescopes, I took a chance and ordered one.

The Galileoscope™: An IYA2009 Cornerstone Project

The Galileoscope™ is a high-quality, low-cost telescope kit developed for the International Year of Astronomy 2009 by a team of leading astronomers, optical engineers, and science educators. No matter where you live, with this easy-to-assemble, 50-mm (2-inch) diameter, 25- to 50-power achromatic refractor, you can see the celestial wonders that Galileo Galilei first glimpsed 400 years ago and that still delight stargazers today. These include lunar craters and mountains, four moons circling Jupiter, the phases of Venus, Saturn's rings, and countless stars invisible to the unaided eye. The Galileoscope costs just US$20 each plus shipping for 1 to 99 units.

Sounds great right? But we all know that "talk is cheap." Well, I am now a believer in this product! I ordered my Galileoscope in early March and didn't receive delivery until mid July. But as I said, I wasn't expecting much for my $20, and the delay turned out to be caused by the sheer number of orders they had.

The telescope arrived in kit form, and thanks to outstanding online directions, it only took 30 minutes from the box to mounting the completed two inch refractor, with two 1 ¼ inch eyepieces being mounted onto my existing photo tripod! It went together easily and probably would for ages 8 and up with adult supervision and for ages 12 and up, building it by themselves. Also, despite the name, the telescope is NOT a model of Galileo's telescope. He would have loved to have an instrument of this quality and capability!

You have to supply your own mount for the scope, but the scope has a standard tripod mount thread on it and the instructions describe how to make a poor-man's cardboard box mount that would work fine. I mounted mine on an inexpensive photo tripod I already had.

The two inch, two element objective lens produces well color-corrected imagery of the Moon and Venus, and the eyepieces produce 18X and 25X images when used individually or by combing these into a Barlow arrangement, you can get up to 50X. I have left it at 25X. First light for the scope was a daylight terrestrial object, the top of a power pole located 1 mile from my house that I frequently use to sight in telescopes and finder scopes. I'm glad I did this during the day because I was able to get familiar with the drawtube focusing of the Galileoscope and get focus set close to infinity before I used it later that night. The daylight images of the mountains we very sharp, but I was trying to not be too anxious in case the night-time views were less spectacular. The first object I looked at later in the evening was the gibbous Moon. Wow! It was tack sharp and I could see all details which I wasn't expecting to see for a $15 dollar telescope. I could also see subtle shade differences and crater details that made me smile. I remembered the views through my very first Tasco two inch refractor with its "75X Zoom" eyepiece that had to cost $50 in the 1960's. You probably had similar experiences with fuzzy imagery and chromatic aberration that made looking at the Moon poorly surreal experience. The Galileoscope is a breath of fresh air.

What can be seen? After studying the Moon with both eyepieces, I decided I liked the 25X view better, made sure the focus was still sharp before I pointed it at Jupiter, about thirty degrees above the eastern horizon. The very first thing I noticed about Jupiter was the four sharply focused moons, one just emerging from behind the planet. I guess I wasn't expecting to even see the Moons very well, let alone the bands, but there they were, the two primary and one set of secondary bands on the planet. I can imagine the inspiration that the GalileoScope will provide youngsters around the world. I observed the beautiful gold and blue double star Albireo at the head of Cygnus next. Great color, nice view. The globular cluster M13 was a nice fuzz ball and I could tell it was a globular and not a comet. The next morning I got up at 4:30 to point the scope at the Orion Nebula and was not disappointed. I resolved everything I expected a two inch telescope to reveal, and the contrast was pretty darn good! I had to kneel on the ground while looked nearly overhead at the nice view of the Andromeda Galaxy M31, ($20 folks! This scope is sooo cool!), then I got the entire Pleiades cluster in the field of view. I saved Venus for last, since it is typically a big problem for inexpensive scopes because Venus appears small, white and very bright. I immediately noted two things. I was looking at a gibbous Venus and that I saw an afterimage from internal reflection between the front two elements and a faint afterimage reflection between the two elements of the eyepiece. The front reflection was a bit distracting, but not overwhelmingly so.

The Moon, major planets, the brighter deep sky objects – all for one twenty dollar bill. Better yet, buy one for yourself and in the spirit of the International Year of Astronomy 2009, buy a second scope for just $12.50 to donate to someone around the world who otherwise would never get an opportunity to see the sky in such detail.

Astrophoto of The Month

Mt. Pinos in July 2009 "Scorpio" by Shane Barker
Canon EOS DIGITAL REBEL XTi, 18mm lens, 30 sec exposure, ISO 1600
Click on the image for a full size view

September Sky Data

Best time for deep sky observing this month:
September 12 through September 23

Mercury is at inferior conjunction (almost directly in front of the Sun) on September 20th. But at the very end of September, it will start to become visible in the eastern sky before dawn, to the lower left of brilliant Venus.

Venus is rising in the north-east in the early hours of the morning, and it's visible in the eastern sky at dawn. At the start of September, Venus comes up more than three hours before the Sun, but each morning it rises a little later, and appears a little lower down. On the morning of Wednesday September 16th, the waning Moon will be close to the upper right of Venus.

Mars is rising in the north-east just before midnight, and by dawn it's well up in the eastern sky. Relative to the stars, Mars is moving steadily eastwards through Gemini, heading towards the bright "Twin" stars Castor and Pollux. Mars itself looks star-like, just a little brighter than either of the "Twins", and slightly orange in colour. In the telescope, Mars shows a tiny disc, around 6 arc-seconds across; it's unlikely to show any detail. On the morning of Sunday September 13th, the waning Moon will appear to be directly above Mars

Jupiter is the only planet well placed for viewing in the evening sky this month. It's due south in the late evening, though at best it's less than 20 degrees above the horizon. In the telescope, the disc of Jupiter shrinks this month from 48 to 46 arc-seconds in diameter; its dark and light cloud-bands should still be clearly visible.

Saturn is at superior conjunction (almost directly behind the Sun) on September 17th, so we won't be able to see the ringed planet at all this month.

There are no major **meteor-showers** in September, though there are various minor showers producing a few meteors an hour from radiants in Cassiopeia, Auriga, Aquarius and Pisces.

Sun and Moon Rise and Set

Date	Moonrise	Moonset	Sunrise	Sunset
9/1/2009	17:45	03:35	06:24	19:17
9/5/2009	19:33	07:26	06:27	19:12
9/10/2009	22:33	12:40	06:31	19:05
9/15/2009	02:59	17:02	06:34	18:58
9/20/2009	08:47	19:45	06:38	18:50
9/25/2009	13:48	23:31	06:42	18:43
9/30/2009	16:42	03:21	06:45	18:36

Planet Data

Sept 1

	Rise	Transit	Set	Mag
Mercury	08:26	14:21	20:14	0.6
Venus	03:47	10:49	17:50	-4.0
Mars	01:08	08:27	15:47	1.0
Jupiter	18:16	23:37	04:58	-2.8
Saturn	07:23	13:46	20:05	1.1

Sept 15

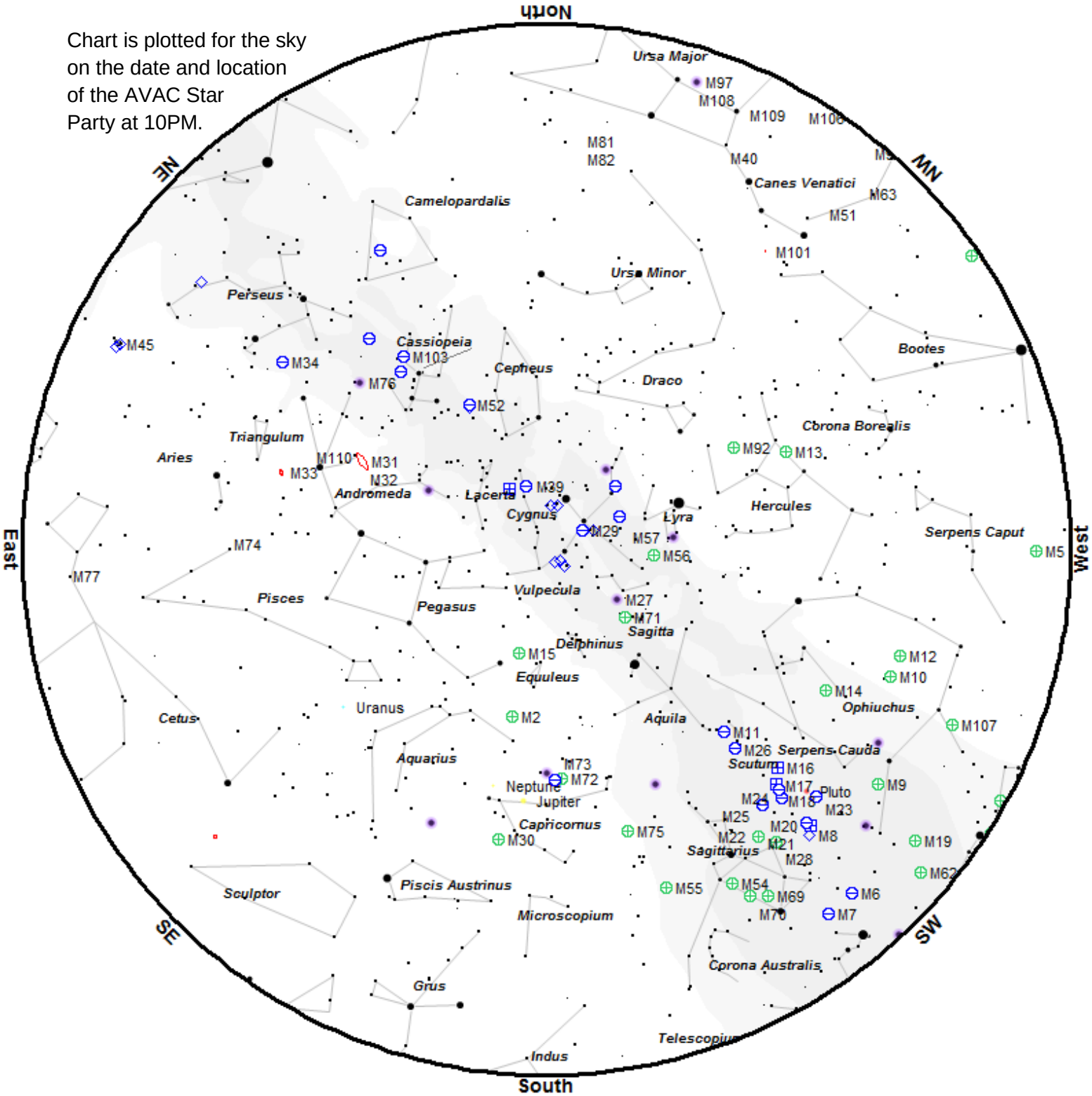
	Rise	Transit	Set	Mag
Mercury	07:14	13:15	19:09	3.2
Venus	04:14	11:01	17:49	-3.9
Mars	00:52	08:09	15:28	0.9
Jupiter	17:16	22:36	03:56	-2.8
Saturn	06:37	12:57	19:15	1.1

Sept 30

	Rise	Transit	Set	Mag
Mercury	05:25	11:42	18:01	0.4
Venus	04:43	11:13	17:42	-3.9
Mars	00:33	07:47	15:03	0.8
Jupiter	16:15	21:34	02:53	-2.7
Saturn	05:46	12:05	18:21	1.1

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

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



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 7	Open	3.3	Sco	17h53m51.0s	-34°47'36"	19:57	20:13	21:04	easy
M 12	Glob	6.1	Oph	16h47m14.0s	-01°56'48"	19:57	20:15	21:07	easy
M 10	Glob	6.6	Oph	16h57m09.0s	-04°06'00"	20:00	20:16	21:09	detectable
M 21	Open	7.2	Sgr	18h04m13.0s	-22°29'24"	19:58	20:17	21:33	detectable
M 20	Open	5.2	Sgr	18h02m42.0s	-22°58'18"	19:56	20:18	21:47	easy
M 8	Neb	5.0	Sgr	18h04m02.0s	-24°23'14"	19:55	20:17	21:50	easy
M 23	Open	5.9	Sgr	17h57m04.0s	-18°59'06"	19:58	20:18	20:47	detectable
M 13	Glob	5.8	Her	16h41m41.0s	+36°27'36"	19:59	20:21	22:29	easy
NGC 6572	PNe	8.0	Oph	18h12m06.4s	+06°51'12"	19:46	20:20	23:01	obvious
M 14	Glob	7.6	Oph	17h37m36.0s	-03°14'48"	20:00	20:20	21:45	detectable
M 18	Open	7.5	Sgr	18h19m58.0s	-17°06'06"	19:54	20:19	21:24	easy
M 28	Glob	6.9	Sgr	18h24m33.0s	-24°52'12"	19:59	20:19	21:37	detectable
M 70	Glob	7.8	Sgr	18h43m13.0s	-32°17'30"	19:59	20:19	21:27	detectable
NGC 6723	Glob	6.8	Sgr	18h59m33.0s	-36°37'54"	19:59	20:19	21:27	detectable
IC 4665	Open	5.3	Oph	17h46m18.0s	+05°43'00"	20:01	20:21	22:00	detectable
M 16	Open	6.5	Ser	18h18m48.0s	-13°48'24"	19:53	20:21	21:44	obvious
M 17	Open	7.3	Sgr	18h20m47.0s	-16°10'18"	20:01	20:21	21:31	detectable
M 25	Open	6.2	Sgr	18h31m47.0s	-19°07'00"	19:59	20:21	21:20	detectable
M 22	Glob	5.2	Sgr	18h36m24.0s	-23°54'12"	19:59	20:21	20:27	detectable
M 92	Glob	6.5	Her	17h17m07.0s	+43°08'12"	19:59	20:22	23:04	easy
NGC 6543	PNe	8.3	Dra	17h58m33.4s	+66°37'59"	19:49	20:23	01:11	obvious
NGC 6633	Open	5.6	Oph	18h27m15.0s	+06°30'30"	19:56	20:23	23:15	easy
NGC 6716	Open	7.5	Sgr	18h54m34.0s	-19°54'06"	19:57	20:23	21:35	detectable
IC 4756	Open	5.4	Ser	18h39m00.0s	+05°27'00"	19:59	20:24	23:03	easy
M 11	Open	6.1	Sct	18h51m05.0s	-06°16'12"	19:59	20:25	22:41	detectable
M 57	PNe	9.4	Lyr	18h53m35.1s	+33°01'45"	19:54	20:27	00:31	easy
M 56	Glob	8.4	Lyr	19h16m36.0s	+30°11'06"	20:00	20:31	23:40	detectable
M 55	Glob	6.3	Sgr	19h40m00.0s	-30°57'42"	20:00	20:38	22:24	detectable
NGC 6818	PNe	10.0	Sgr	19h43m57.8s	-14°09'12"	19:50	20:42	23:07	easy
M 71	Glob	8.4	Sge	19h53m46.0s	+18°46'42"	19:56	20:51	00:45	easy
M 27	PNe	7.3	Vul	19h59m36.3s	+22°43'16"	19:56	20:57	00:56	easy
NGC 6871	Open	5.8	Cyg	20h05m59.0s	+35°46'36"	19:56	21:03	01:21	easy
NGC 6910	Open	7.3	Cyg	20h23m12.0s	+40°46'42"	19:57	21:20	01:55	easy
M 29	Open	7.5	Cyg	20h23m57.0s	+38°30'30"	19:57	21:21	01:46	easy
NGC 7009	PNe	8.3	Aqr	21h04m10.9s	-11°21'48"	19:49	22:01	00:43	obvious
M 15	Glob	6.3	Peg	21h29m58.0s	+12°10'00"	20:00	22:27	02:00	easy
M 39	Open	5.3	Cyg	21h31m48.0s	+48°26'00"	19:57	22:28	03:27	easy
M 2	Glob	6.6	Aqr	21h33m27.0s	-00°49'24"	20:01	22:30	01:37	detectable

ID	Cls	Mag	Con	RA 2000	Dec 2000	Begin	Best	End	Difficulty
M 30	Glob	6.9	Cap	21h40m22.0s	-23°10'42"	21:31	22:37	23:44	detectable
NGC 7160	Open	6.4	Cep	21h53m40.0s	+62°36'12"	19:53	22:47	04:53	obvious
NGC 7243	Open	6.7	Lac	22h15m08.0s	+49°53'54"	20:03	23:11	03:18	detectable
NGC 7293	PNe	6.3	Aqr	22h29m38.5s	-20°50'14"	21:52	23:27	01:01	detectable
M 52	Open	8.2	Cas	23h24m48.0s	+61°35'36"	20:21	00:17	04:25	detectable
NGC 7790	Open	7.2	Cas	23h58m24.0s	+61°12'30"	19:59	00:51	05:35	obvious
NGC 7789	Open	7.5	Cas	23h57m24.0s	+56°42'30"	21:08	00:50	04:40	detectable
M 110	Gal	8.9	And	00h40m22.3s	+41°41'09"	21:52	01:36	05:17	detectable
M 32	Gal	8.9	And	00h42m41.8s	+40°51'58"	21:11	01:38	05:30	easy
M 31	Gal	4.3	And	00h42m44.3s	+41°16'07"	21:08	01:39	05:31	easy
NGC 253	Gal	7.9	Scl	00h47m33.1s	-25°17'20"	23:35	01:44	03:52	detectable
NGC 457	Open	5.1	Cas	01h19m35.0s	+58°17'12"	20:24	02:12	05:38	obvious
NGC 559	Open	7.4	Cas	01h29m31.0s	+63°18'24"	20:21	02:22	05:36	easy
M 103	Open	6.9	Cas	01h33m23.0s	+60°39'00"	20:32	02:26	05:40	obvious
M 33	Gal	6.4	Tri	01h33m50.9s	+30°39'36"	22:42	02:30	05:31	detectable
NGC 637	Open	7.3	Cas	01h43m04.0s	+64°02'24"	20:33	02:36	05:40	obvious
NGC 663	Open	6.4	Cas	01h46m09.0s	+61°14'06"	20:59	02:39	05:36	easy
M 76	PNe	10.1	Per	01h42m19.9s	+51°34'31"	22:32	02:39	05:30	detectable
NGC 869	Open	4.3	Per	02h19m00.0s	+57°07'42"	21:27	03:11	05:40	obvious
NGC 884	Open	4.4	Per	02h22m18.0s	+57°08'12"	21:30	03:14	05:40	obvious
NGC 957	Open	7.2	Per	02h33m21.0s	+57°33'36"	22:10	03:26	05:36	easy
NGC 1027	Open	7.4	Cas	02h42m40.0s	+61°35'42"	23:13	03:35	05:32	detectable
M 34	Open	5.8	Per	02h42m05.0s	+42°45'42"	23:18	03:38	05:35	easy
M 77	Gal	9.7	Cet	02h42m40.8s	-00°00'48"	00:38	03:39	05:34	detectable
NGC 1342	Open	7.2	Per	03h31m38.0s	+37°22'36"	00:17	04:28	05:36	easy
M 45	Open	1.5	Tau	03h47m00.0s	+24°07'00"	00:06	04:43	05:40	obvious
NGC 1444	Open	6.4	Per	03h49m25.0s	+52°39'30"	23:08	04:44	05:42	obvious
NGC 1528	Open	6.4	Per	04h15m23.0s	+51°12'54"	00:08	04:59	05:38	easy
NGC 1664	Open	7.2	Aur	04h51m06.0s	+43°40'30"	00:54	05:06	05:39	easy
NGC 1647	Open	6.2	Tau	04h45m55.0s	+19°06'54"	02:19	05:07	05:34	detectable
NGC 1746	Open	6.1	Tau	05h03m50.0s	+23°46'12"	02:28	05:08	05:34	detectable
M 38	Open	6.8	Aur	05h28m40.0s	+35°50'54"	02:13	05:10	05:35	detectable
M 36	Open	6.5	Aur	05h36m18.0s	+34°08'24"	01:39	05:10	05:39	easy
M 37	Open	6.2	Aur	05h52m18.0s	+32°33'12"	02:02	05:10	05:38	easy
M 35	Open	5.6	Gem	06h09m00.0s	+24°21'00"	02:40	05:12	05:36	easy
NGC 2129	Open	7.0	Gem	06h01m07.0s	+23°19'20"	02:22	05:12	05:39	obvious
NGC 2175	Open	6.8	Ori	06h09m39.0s	+20°29'12"	03:13	05:12	05:34	detectable
NGC 2169	Open	7.0	Ori	06h08m24.0s	+13°57'54"	02:53	05:13	05:40	obvious
M 42	Neb	4.0	Ori	05h35m18.0s	-05°23'00"	03:21	05:12	05:38	easy
NGC 2264	Open	4.1	Mon	06h40m58.0s	+09°53'42"	03:36	05:14	05:37	obvious
M 82	Gal	9.0	UMa	09h55m52.4s	+69°40'47"	04:24	05:15	05:35	easy
M 81	Gal	7.8	UMa	09h55m33.1s	+69°03'56"	04:25	05:15	05:33	detectable
NGC 2392	PNe	8.6	Gem	07h29m10.8s	+20°54'42"	03:56	05:16	05:41	obvious
NGC 2301	Open	6.3	Mon	06h51m45.0s	+00°27'36"	04:17	05:16	05:37	easy

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