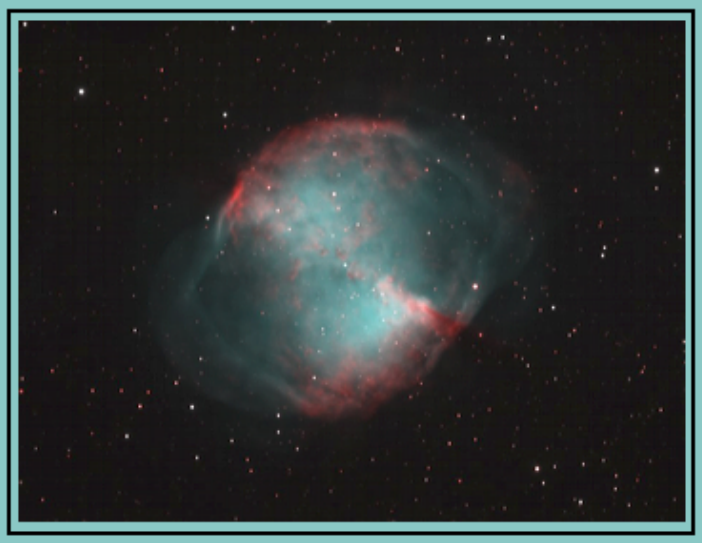
THE METEORITE

M-27
NGC 6853
The Dumbbell Nebula
In Vulpecula



Newsletter of the Mahoning Valley Astronomical Society, Inc.

1982 Mathews Rd. #2
Youngstown OH 44514

IN THIS ISSUE:

JUNE 2013

Meteorite Editor: Phil Plante

THE METEORITE

Newsletter of the Mahoning Valley Astronomical Society, Inc.

JUNE 2013

MVAS CALENDAR

JUN 14	Bill Pearce Memorial Stargaze, Austintown Park
JUN 15	Public Night at Scenic Vista. 8:00 PM
JUN 29	Business meeting at the MVCO. 8:00 PM
JUL 13-14	YSU Festival of Arts. At Planetarium noon to 5PM
JUL 27	Business meeting at the MVCO. 8:00 PM

NATIONAL & REGIONAL EVENTS

JUL 24-27 **ALCON 2013.** Fernbank Science Center in Atlanta, GA. Astronomical League and ALPO annual meeting. Hosted by the Atlanta Astronomy Club. Lodging at the Emory Conference Center. Speakers, vendors, planetarium shows, Star BQ. Information and registration ($50) on-line: www.alcon2013.astroleague.org

AUG 1-4 **Indiana Family Star Party.** Held at Camp Cullom, in Frankfort, IN - 50 miles NW of Indianapolis. Registration $20 per person. $30 per family. Includes camping on the observing field. http://indianastars.us/starparty

AUG 6-11 **AstroBlast 2013.** Oil Region Astronomical Observatory, Oil City, PA. This is the 20th annual event. Individual and famly rates. Details on website. http://www.oras.org

MVAS, P.O. BOX 564 NEWTON FALLS, OH 44444-9998
MVAS Homepage- http://mvobservatory.com

NEWS NOTES

A Drink for Martians. A team of UK-Canadian scientists have discovered ancient pockets of water, which have been isolated deep underground for billions of years. It contains abundant chemicals known to support life. The Researchers from the universities of Manchester, Lancaster, Toronto and McMaster analyzed water pouring out of boreholes from a mine 2.4 kilometers beneath Ontario, Canada The similarity between the rocks that trapped the water and Martian rock raises the hope that comparable life-sustaining water could lie buried beneath the Martian surface

They found that the water is rich in dissolved gases like hydrogen, methane and isotopes of helium, neon, argon and xenon. There appears to be as much hydrogen in the water as around hydrothermal vents in the deep ocean, many of which teem with microscopic life. Using new dating techniques developed at the University of Manchester, the fluid appears to be at least 1.5 billion years old, but could be much older. They are trying to find out if the water contains life right now. The researchers think they have identified a way in which planets can create and preserve an environment friendly to microbial life for billions of years. This is regardless of how inhospitable the surface might be, opening up the possibility of similar environments in the subsurface of Mars.

Finding a Lunar Drink? Data from recent NASA spacecraft and new research on samples from the Apollo missions all indicate that the Moon has water; on its surface and beneath. The Moon is thought to have formed from a disk of debris left over when a Mars-sized impactor hit the Earth 4.5 billion years ago. This is called the “Giant Impact“. It is estimated that the heat from that impact would cause hydrogen and other volatile elements to boil off into space, meaning the Moon must have started off completely dry. The impactor theory also requires that most of the Moon’s material came from the impactor.

An analysis was made of the deuterium-hydrogen ratio in water trapped in lunar glass samples, which were brought back from the Moon by the Apollo 15 and 17 missions. The measurements revealed that the hydrogen isotopes matched those from a type of meteorite called carbonaceous chondrites. Because Earth's water is also matched by carbonaceous chondrites, the two bodies likely have obtained their water from the same source. The evidence suggests that the Earth was already wet at the time of the Moon-forming collision and that water within the Moon was inherited from the Earth. This is the best evidence yet that carbonaceous chondrites were a common source of water in the Earth and Moon, and perhaps the entire inner solar system.

Live Long and Prosper. The voting campaign to pick names for two of Pluto's smallest moons has a clear winner with "Vulcan”. It was proposed by William Shatner of "Star Trek" fame. Cerberus came in second place. SETI officials that conducted the public poll say that Vulcan is appropriate; being the Roman god of lava and smoke, and the nephew of Pluto. Any connection to the 'Star Trek' is purely coincidental. Although Vulcan and Cerberus won the name poll, the final decision on the moon names will rest with the International Astronomical Union. Astronomers have found five moons around Pluto so far, with three of them named: Charon, Nix and Hydra.

MINUTES OF THE MAY MEETING

MAY 25, 2013 at the MVCO

The meeting was called to order at 8:00 PM by President Lou DiNardo. Roll Call was taken. Seventeen members were present along with three guests; Donna Cherry, Krystal Shepard and Virginia Bartos. A Call for the Reading of the Minutes was made. Rosemary Chomos moved to suspend the reading. With a second from Bob Danko, the membership voted to skip the reading. With no further discussion or corrections brought forth, the minutes were accepted as published, by voice vote.

TREASURER'S REPORT: The Report was read by Steve Bartos. No questions or correction requests were made. Larry Plante moved to accept the Report. Don Cherry seconded the motion. By a unanimous voice vote, the Report was accepted.

General Fund	**4/1 thru 4/30 2013**	
OPENING BALANCE:	$	8,832.03
CLOSING BALANCE:	$	9,010.92
AVAILABLE FUNDS (NON-RESERVED):	$	4,846.80
ACCOUNT NET GAIN/LOSS FOR THIS PERIOD:	$	+178.89
INCOME:		
DUES	$	120.00
MVAS MERCHANDISE	$	134.00
DONATION (BOB DANKO)	$	4.00
INTEREST	$	0.15
TOTAL INCOME	$	258.15
EXPENSES:		
CK# 2788 NEW COFFEE MAKER	$	79.26
TOTAL EXPENSES	$	79.26
Reserved Funds		
KEY DEPOSITS (MVCO)	$	250.00
CASH FROM ORIGINAL OAD FUND (FOR LAND)		3,914.12
TOTAL RESERVED FUNDS	**$**	**4,164.12**

2013 DUES PAID BY: D. Cherry, J. Haklar, M. Hoffman.

CORRESPONDENCE: Steve Bartos received the new insurance policy from Western Reserve Group. It is still sold through Holloway Insurance. The current premium with the new carrier is $300 per year. The MVAS P.O. Box received a letter from the "Honor Project". We received it due to our 501(c)3 status. Apparently litigation in Cuyahoga County resulted in excess money in a settlement. This money needs to be distributed to like organizations. MVAS might be eligible and had to register. Some noted these things turn up as scams. No further action was from the members was dictated. We also received the NASA/JPL package from Night Sky Network. A nice calendar was in the packet and will be kept at the MVCO. Several information sheets were sent as well. Jodi will use these at the Scouting session at Austintown Park.

COMMITTEE/OFFICER REPORTS: *IMAGING COMMITTEE:* Jodi reported that Sky & Tel was having a sale on imaging processing tutorials (on-line classes). She tried the one for Registax. Using it she obtained the best image of Saturn she had ever made. Sale lasts until June and she recommends imagers or potential imagers check these out. A link was to be sent to the MVAS e-mail group. *VISUAL COMMITTEE:* No Visual Committee reports turned in nor was any Homework. *LIBRARIAN:* Rosemary is reluctant to bring new books into the building until the issue with the roof is settled (fixed).

OBSERVATORY DIRECTOR'S REPORT: Larry Plante reported that he and Steve Bartos have replaced the shutter cable with chain very similar to the original chain. The shutters are working again. He also obtained pricing on roofing materials. For our 24 sqr. Ft. roof area, shingles would cost around $700 before the expense of supporting plywood and trusses. This was deemed too expensive. Options included galvanized steel panels (corrugated). 12' x 2' would cost ~$380 from Home Depot. Wider 12' steel panels from Lowe's would cost as much as shingles. PVC panels were about $16 each but available as a stocked item. Steel sheeting seems the way to go. The cost of lumber for the trusses would bring the cost up to $500-$600. Phil pointed out that we were facing (and would need to pay) a $900 minimum cost to fix and keep the flat roof.

Rosemary asked if we had considered using a contractor. The general feeling was this would be very expensive. Larry thinks we can do this our selves with some advice on how to attach the new pitched roof to the existing flat roof. Chris Stephan suggested we look into hiring an Amish crew to do the work. It was suggested Mike Boyer would have the advice. Rosemary asked about sealing the area between the new roof and the dome. New construction will be closed and spouting could handle the water where the new roof and dome meet. Topic to be continued.

OLD BUSINESS: Jodi has had trouble contacting Tom Fields as an internet speaker for the OTAA. Phil noted that Black River was also trying to get him as a speaker. He may be swamped with requests. Jodi will continue efforts to contact him. If she can't get in touch, we may need to find a speaker. Bob noted we could get by with out one. Mike Unsold (image processing) was suggested. The 1st Bill Pearce Memorial Star Gaze will be held June 14th at Austintown Park for a scouting troop. Jodi thinks having several stations set-up would be most efficient. Each would focus on one object or topic. If you would like to help contact Rich Mattuissii.

NEW BUSINESS: Don Cherry would like to bring a group of about 10 students to the MVCO to show them the telescopes and observe. The date would be sometime in September when the kids are back in school. Looking at the MVAS calendar the first two weekends are already slated for activity. The last two could work, but the last weekend is our meeting night. Phil noted it would be best to show the students during daylight; for views of the equipment and for safety reasons. As it gets dark, observing could be done. He also noted that a few hot dogs might be rustled-up for the kids. We'll have time over summer to work something out.

Larry and Steve saw a nice double burner grill at Home Depot for $159.00. Jodi McCullough moved to purchase it. Karin DiNardo seconded. All were in favor of the purchase by unanimous voice vote. Larry also saw a 120ft garden hose at Sam's Club for around $27. It seems ours is missing. Bob Danko and Karin DiNardo moved to purchase the hose. All were in favor by vote. Bob Dank asked if he could borrow the MVAS placard in the 8" building. He will be bringing his telescope to the June 8th River Fest in Youngstown. This event is aimed at making the Mahoning River be part of a push for tourism with Youngstown as a destination. He explained efforts to clean up the river, renovate old dams and open the river to canoeing and fishing. He was granted permission to borrow the placard. He also asked for any MVAS flyers and obtained an MVAS meeting schedule so that he might give these out to promote the MVAS and recruit new members.

GOOD OF THE SOCIETY: Rosemary brought up discussion of the OTAA prizes. Several suggestions were made regarding the main prizes. Jodi suggested an iOptron Sky Tracker with a ball head mount. Having just bought one, she thinks it performs rather well. Bob suggested a pair of binoculars with solar filters. Donations for door prizes are being accepted. At this meeting Chris Stephan is willing to donate a new 2" barrel, 26mm Meade Plossl eyepiece. Chris will also donate two green laser pointers for use at the MVAS as well as a new book called "The Planets'. Bob Danko has a Double Star book by Sissy Haas to donate. Time for members to start shopping for door prizes. Chris will contact High Point Optics to see what deals they might have. Bob will contact Hands On Optics for the same reason.

Chris asked about the status of the 50" noting it had been a sticking point within the club from the beginning. Selling it would be tough. After some reminiscing and light hearted grimacing on the topic, Phil mentioned the apparent "curse" on the blank- some people die when they take possession of it. He says it is just fine where it was at. [Addendum: We should at least remove its heavy weight from the porch to protect the porch and foundation from any possible damage]. Bob reminded us that Phil still has ideas of getting it done.

VISUAL REPORTS: Phil managed only 4 variable star estimates in May. Bob searched for comet PanSTARRS with the 8" refractor but had no luck. He looked for the Jupiter, Venus and Mercury grouping at sunset but couldn't find Mercury. Lou DiNardo did some visuals and imaging in May. He spotted Saturn's C Ring (Crepe Ring) and Saturn's 5 brightest moons. Eric Klesch saw a fiery (bolide?) meteor one night.

ADJOURNMENT: Adjournment came at 9:05 PM with a motion and second from Rosemary and Karin. We thank all that shared food and drink during the BBQ after the meeting. Phil Plante gave a presentation on variable stars. The next meeting will be at the MVCO on June 29, 2013. Meeting begins at 8:00 PM. Scheduled hosts are Keith Janeco (main meal) and Larry Plante (desserts, drinks). A talk is scheduled for after the meeting. PASSWORD: Name a double star. *-minutes by Phil Plante*

MVAS REMINDERS

June 14: The first Bill Pearce Memorial Stargaze, as discussed in our January Meeting will held at Austintown Park on Friday June 14. Time is 9:00 PM to 11:30 PM at the latest. MVAS members could stay later if there is a clear sky. This will be session will conducted by Rich Mattuissi on behalf of the Cub/Boy Scout Troop 184 from St. Joseph Church in Austintown. The scouts need to work on their Astronomy Merit Badge requirements. Topics our MVAS members could handle well: Constellations, moon phases, observations, discussion about scopes and light pollution, etc. Approx. 30-35 kids plus parents and Scout Masters. The following night we have Scenic Vista event scheduled. Rich is inviting the Troop to come down to Lisbon also. Contact Rich if you are willing to help on Friday.

June 15: Our second of three Scenic Vista Public nights in 2013 will begin at sunset (9:00 PM). Please bring your scopes to help out and observe under darker skies once the public leaves. They are usually all gone by midnight. The Park Program Director has indicated that she would like to take some promotional photos of the MVAS in action during the event. If we get lucky with clear skies and a good turn-out of scouts, it might make for some "action" packed images. Remember to wear your MVAS duds. Snacks and drinks are B.Y.O.

OTAA Prizes: Please start collection or searching for some items you can purchase for use as a door prize. Astronomy gadgets or books/DVDs are just fine. But they can be non-astronomy items that are useful during observing sessions or not. Flashlights, coffee mugs, sports/water bottles, outdoor thermometer, clocks, electronic media (jump drive, blank DVD, etc), novelty T's or hats. You may limit expense to $30 or less for each item. Thanks in advance.

Imaging videos: Jodi McCullough bought a suite of image processing videos from Sky & Telescope. She got a 25% discount on these. Unfortunately the offer expired on June 1st. You can find them at the link below:

https://bay173.mail.live.com/default.aspx?id=64855#n=2098980531&fid=&st=SkyandTelescope&mid=ba3ac0d0-c2e9-11e2-98f3-00215ad7b3e2&fv=1

Having used only part of the planetary video she was so impressed with the results that she thought everyone should know. She used 2 of the 3 techniques on planetary images so far, using Registax 6 and Photoshop CS2. Even though the sale is over by the time you get this, imagers might want to investigate for purchase now or wait for another sale, hoping they have one.

2013 convention dates for OTAA clubs:

AUG 3 Cuyahoga Astronomical Association (**CAA**). 3:00 PM registration. Dinner around 4:30 PM. At Letha House

AUG 3 Chagrin Valley Astronomical Society (**CVAS**). 12 noon till midnight. 50th Anniversary Celebration. Indian Hill Observatory.

Aug 10 Mahoning Valley Astronomical Society (**MVAS**). Doors open at 5:00 PM with registration, dinner 6:15 PM. Mahoning Valley Cortese Observatory.

SEP 7 Black River Astronomical Society (**BRAS**). 1:00 PM till midnight. Birmingham, OH.

MVAS ACTIVITIES

Scenic Vista Stargaze: The May 11th event was mostly clouded out. Mike Heim stopped by the Park early in the evening. It was clear for a while, he reported. No one else was there so he left. Better luck this month?

MVAS BBQ: After the May meeting our Memorial Day cook-out went off as planned. Several brought dishes to share. Larry had the jalapeño hot dogs and burgers. Virginia had a good veggie salad. Especially tasty was the Filipino dish Pancit (rice noodles and chicken) that was brought by Don Cherry. Now with Filipino and Indian cuisine, we have an international menu! Afterwards Phil Plante gave a talk called "Variable Stars, A Stellar History". It covered our knowledge stars and stellar evolution.

JUNE TALK: Our June meeting talk will be "Free and Inexpensive Astronomy Computer Programs and i-Phone/ i-Pad apps." This will be a talk/share-a-thon so bring along your favorites! If you would send Jodi any links to free programs/apps, she will download them before the meeting so they can be projected. Her e-mail is jmccul@hotmail.com.

Observer's Notes: Double-up!

Double stars are two (or more) stars that are bound together by gravity, orbiting around a common center of gravity. They are commonly known as "double or binary stars". Although they are actually separated by many millions of miles in space, they appear very close to each other in a telescope. This due to their great distance from us. It's believed that about 85% of stars are in binary or multiple star systems. In a telescope their separation appears to be anywhere from several arcminutes apart down to sub-arcsecond separations. In some cases the telescopic separation is so tiny that their duplicity can only be discovered from the periodic Doppler shifts in their spectrum; caused by the orbital motions of the binary star components. These are called spectroscopic binaries. Lunar occultation work by amateurs can detect or even discover spectroscopic binaries from the step-wise disappearance or re-appearance at the lunar limb. Special video and timing equipment is needed to record these quick events.

The majority of binary star observers look for those doubles that are gravitationally bound or those that are aligned next to each other in line-of-sight geometry (the optical doubles). For many observers, splitting close doubles with their telescope is a favorite pastime. Sometimes, a close double is used to "push" the telescope to its performance limit of resolution. The most often used rule of thumb is called the Dawes Limit. This is a simple formula (division) that gives the closest spacing in arcseconds, in which two stars of equal magnitude can be split. The Dawes limit is simply 4.5/D, where "D" is the telescope aperture in inches. Thus a 4.5 inch scope should split stars 1 arcsecond apart: 4.5/4.5 inches= 1" (arc second).

At magnifications of 200x or more, stars will appear as a very tiny disk called the Airy Disk. A star is split when the two airy disks are in contact with each other, appearing as a double lobbed star. When it comes to splitting doubles at the Dawes limit, good seeing and high magnification are required. A cooled down telescope with good and well collimated optics will also have a distinct advantage. Another pleasant aspect of double star viewing is that there is often a color difference between the component stars. The hues are reminiscent of the subtle colors found in gemstones. Once one acquires an "eye" for colorful doubles, a few almost always end up on your favorite object list. And as a bonus of sorts, double star viewing can be carried out in moonlit or light polluted skies.

The brighter star is called the primary or "A" star. The fainter star is called the companion, or "B" star. Other stars in the system also have a letter identifier; C, D, etc. Separation is given in arc seconds. The orientation of the companion star to the primary (always the reference star) is given as the Position Angle (PA). Given that there are 360° in a circle, 0° represents north, 90° indicates east, 180° is south and 270° is west. These are the true sky directions as seen with an unaided eye. If you use PA to help identify a companion, you'll need to account for any image flip-flop your scope may give.

The naming of double stars seems confusing at first. There are several dozen different ways to "tag" a double star. The number they carry is from the original discoverer's catalogue. In the past, only a handful of astronomers were active in this field. They where William Herschel, John Herschel (William's son), Wilhelm Struve, Otto Struve (Wilhelm's son), and S. W. Burnham. Most of the double stars that the average observer seeks out will come from their catalogs. It should be noted that if a double star was discovered in which it already had a name such as a Bayer (Greek letter) or Flamsteed designation, the double star continues to be referred to by its original name. There was an attempt in 1932 to coordinate the increasingly complex naming scheme into a simpler system. It was called the ADS (Aitken's Double Star Catalogue). Published in 1932, it listed most of the doubles known at that time by order of right ascension. Over 17,000 doubles were listed in the catalogue and many astronomers refer to the double stars by the ADS number over any other name.

When specifying a particular star from one of the above astronomers' catalog, their name is abbreviated by using one or more letters (usually Greek), which is then followed by the appropriate catalog number. For example, the symbol Σ is for a double star that Wilhelm Struve discovered. You call it "Struve" followed by its number. OΣ is a double star discovered by Otto Struve, the son of Wilhelm. A double with this symbol is pronounced "Otto Struve", followed by the number. OΣΣ refers to a catalogue that Otto Struve published in 1843. It contains many wide doubles; many could be considered as binocular doubles. β refers to doubles found by S. W. Burnham (1838-1912) and is likewise read as "Burnham", then the number.

It is fitting that their names will always be associated with the stars. The names add a sense of familiarity, personality and history to the star. Something that a cold catalog number could never do. Summer offers an assortment of colorful doubles and decent observing conditions. Find an old copy of *Webb's Celestial Handbook For Common Telescopes*. Grab the *Double Star Atlas*. You can relive those observations Webb listed in 1859. Or check out the doubles at the bottom of each "Constellation of the Month" chart in the *Meteorite*. *-Plante*

A Short Summer list to "Double-up"

24 Com	5.1-6.3	20"	gold, blue	α CVn	2.9-5.6	19"	blue, green
ε Boo	2.6-4.8	3"	yell., blue	ξ Boo	4.8-7.0	6"	yell., orange
π Boo	4.5-4.9	5"	white, rose	β Sco	2.6-4.9	14"	green, yell.
α Sco	1.0-5.4	2.2"	oran, green	α Her	3.5-5.4	5"	red, green
β Cyg	3.1-5.1	35"	gold, blue	11 Aql	5.3-9.3	19"	yell., blue

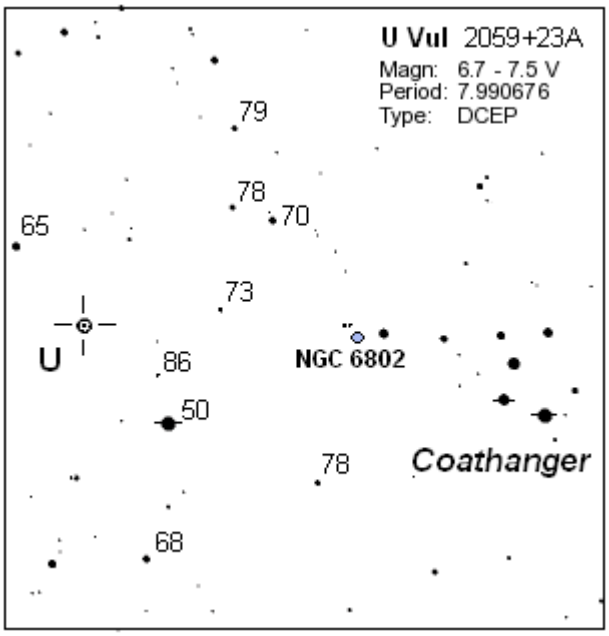
MVAS Homework: The Dumbell Nebula

The Dumbbell Nebula (M27, NGC 6853) is one of the finest planetary nebula in the sky. It was the first planetary nebula ever discovered. On July 12, 1764, Charles Messier discovered this new class of objects. He described it as an oval nebula without stars. The name "Dumbbell" goes back to the description made by John Herschel around the year 1864, when he published his *General Catalogue of Nebulae and Clusters*. M-27 is also sometimes called the "Apple Core" nebula. The Dumbbell Nebula sits about 1,360 light years away from earth, and is about one light-year across. It's also notable because of the central star: it's the largest known white dwarf star and it shines at about 13.5 magnitude.

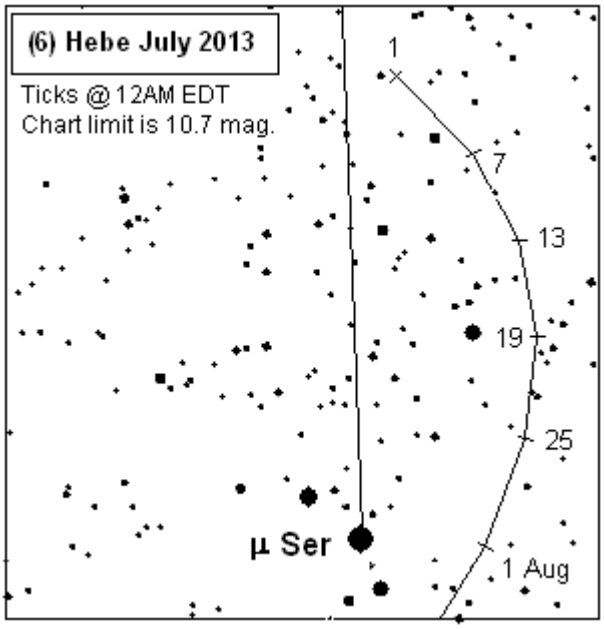
Observing M-27 in a large telescope such as Titan (25") is a treat. On especially dark and transparent nights, the faint spherical halo glow blazes forth with a blue fluorescence. It looks like a football rather than an apple core. It is a sight you won't forget very soon. An Olll of UHC filter helps in light pollution. Smaller scopes provide excellent views as well. Color has been seen in scopes as small as 4 inch aperture. There is every opportunity to make a sketch of this bright object. Or, imagers can stack short exposures- if they fret the pencil and paper techniques. It's all good. You just need to get at it. Let's see some sketches!

MVAS OBSERVER CHARTS

Variable star of the month: **U Vulpeculae** (*abbrev:* U Vul). Our variable this month is a Delta Cepheid type variable star. It ranges in brightness by only 0.8 magnitude with maximum light coming at 7.99 day intervals. It is near center-left on the chart below. This was done to allow the "Coat Hanger" to be included on this small chart. This variable is easy to follow in finders or binoculars. Having the Coat Hanger around is a helpful bonus.



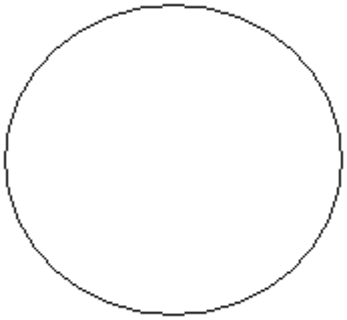
Asteroid of the month: (**6) Hebe.** This is the last month we'll follow faint Hebe as it courses through Serpens. It drops from magnitude 10.0 to 10.4 from July 1st to August 1st. Just barely detectable to a novice but should be fair game to more experienced observers. You'll need a scope again. Can't use your binoculars ALL the time!



MVAS OBSERVATIONS - DUE JULY 2013

OBSERVER_____

Featured object: M-27 . Please try a sketch. Fill in the field stars first. If your scope is non-tracking, be sure to re-center the star grouping exactly as it appeared in the eyepiece when you started drawing-in the "start dots". These are your reference points for outlining the nebulosity. Smudge the graphite to approximate the nebular glow. Make a negative..brighter areas are drawn darker.



M-27 Observation:

Date:_____ Time(EDT)_____ Scope_____

U Vul magnitude estimates:

Date:	Time:	estimate:	Instrument:
_____	_____	_____	_____
_____	_____	_____	_____

(6) Hebe Observations:

Date:	Time:	Instrument:	magnification:
_____	_____	_____	_____
_____	_____	_____	_____

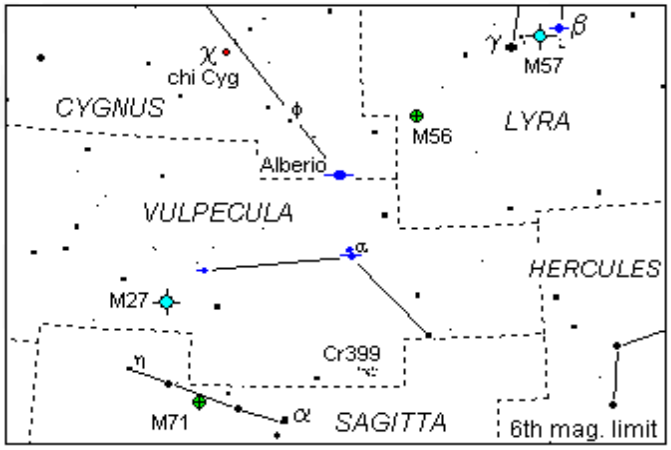
Other Objects in Vulpecula to observe

D. Sky	Date	Scope	**Dbl.**	Date	Scope	SEP	MAG	SPLIT?
Cr- 399	_____	_____	6/8 Vul	_____	____	424"	4.6 - 5.9	Y / N
N- 6802	_____	_____	Σ 2521	_____	____	27.9"	5.8 - 10.5	Y / N
N- 6823	_____	_____	Σ 48	_____	____	42.5"	7.1 - 7.3	Y / N

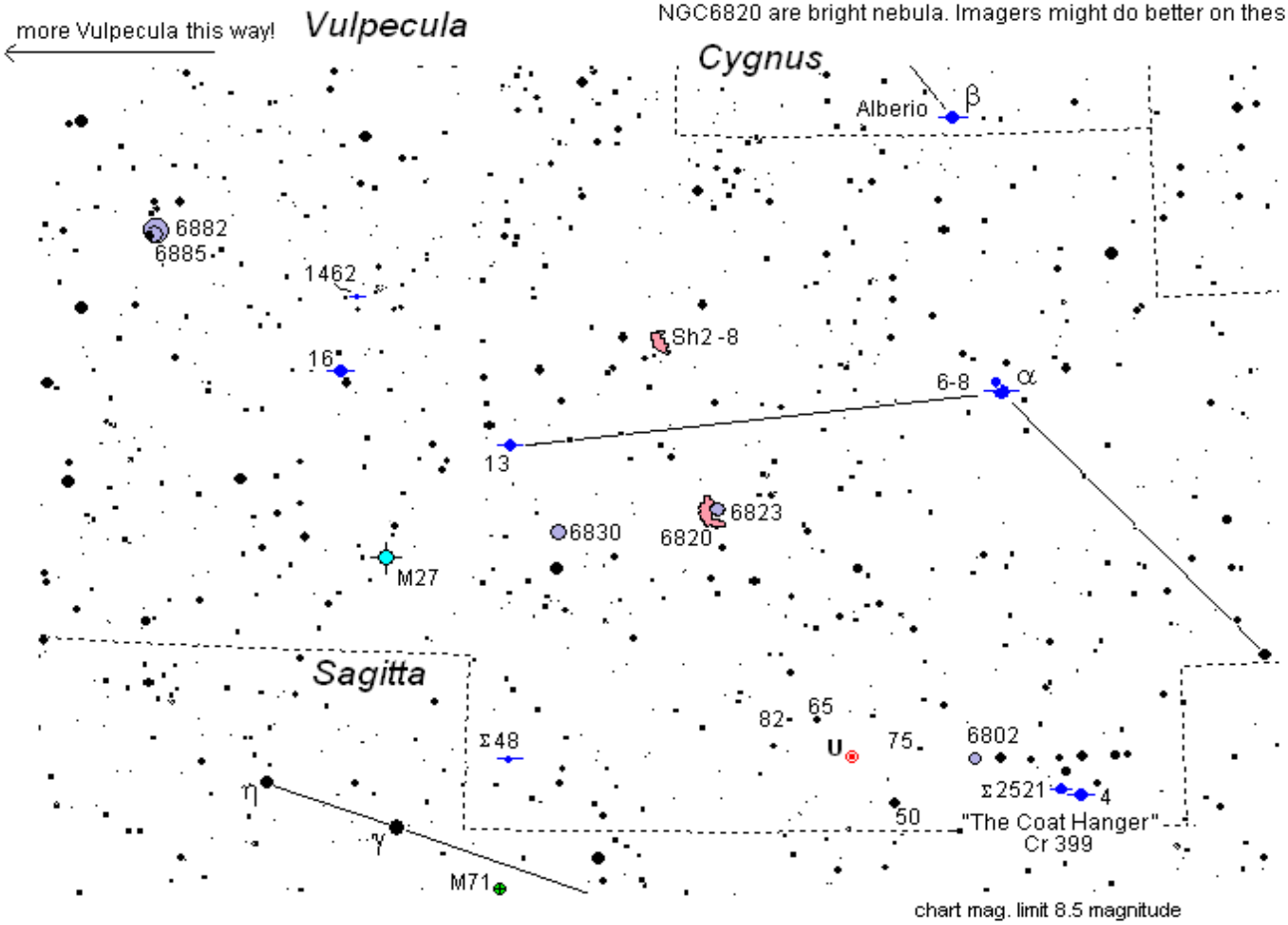
Lunar Occultations (see Sky Almanac):

Star	(UT) Date	Time	Scope	magx.	Event(circle)
_____	_____	_____	_____	____x	R D
_____	_____	_____	_____	____x	R D
_____	_____	_____	_____	____x	R D

Constellation of the Month — Vulpecula



Like its namesake, Vulpecula the Fox is elusive. No bright stars to guide you! From mid to late summer it lingers near the meridian for a few hours before and after midnight. Look south of the famous double star Alberio. Easiest thing to spot with binoculars is Brocchi's Cluster, often called the Coat Hanger- for obvious reasons. Close inspection with a scope should get you a few doubles in the group. Off the eastern end is open cluster NGC6802. A tough one in the the MVAS 8" but it is visible. Try some of the other doubles and clusters that are plotted. Alpha (6-8) should be nice in binoculars. We can't corner the Fox without checking out a standard stop on the Messier list. That would be M-27, the Dumb-bell Nebula. Mostly it looks like an hour-glass but in bigger scopes it turns more eliptical. What shape do you see? Can you see a central star? You can follow a delta Cephied by watching U Vul with binoculars. Several comparison star magnitudes are labeled near it on this chart. Sh2-8 and NGC6820 are bright nebula. Imagers might do better on these.



DEEP SKY

6882	8.1	18'	
6885	8.1	7'	OC, 30 stars
M27	7.6	6.7'	planetary neb
Sh2 -88	17.5' x 9'		bright nebula
6830	7.9	12'	OC, 20 stars
6820			
6823	7.1	12'	OC, 20 stars
6802	8.8	3.2'	OC 50 stars

DOUBLES

4 Vul	5.2, 10.0, 11.7	18.9"–51.6"	triple star
6-8 Vul	4.6, 5.9	424.5"	deep yellow, pale yellow
13 Vul	4.6, 9.6	0.8"	
16 Vul	5.8, 6.2	0.8"	both deep yellow
Σ48	7.1, 7.3	42.5"	both bluish white
Σ2521	5.8, 10.5	27.9"	topaz yellow, blue
h1462	7.6, 9.9	37.0"	tangerine-orange, white

VARIABLE: U VUL 6.7 -7.5mg. 7.99 days type: DCEP

Instruments used:

_____ on _____

_____ on _____

_____ on _____

U VUL

_____ mag. on ___/___/____

_____ mag. on ___/___/____

_____ mag. on ___/___/____

2013 JULY SKY ALMANAC

Solar and Lunar (EDT).

Date	Sunset	Moonrise	Moonset
1	9 : 01	01 : 27a	— : —
5	9 : 00	03 : 56a	— : —
9	8 : 59	— : —	9 : 53p
13	8 : 57	— : —	11 : 32p
17	8 : 54	— : —	01 : 12a
21	8 : 51	— : —	04 : 53a
25	8 : 48	10 : 24p	— : —
29	8 : 44	12 : 01a	— : —

PLANET WATCH

	Saturn	Pluto	Uranus
	Sets	*Transits*	*Rises*
1	2:25a	1:30a	1:15a
5	2:09a	1:14a	12:59a
9	1:53a	12:58a	12:44a
13	1:37a	12:42a	12:28a
17	1:21a	12:25a	12:12a
21	1:06a	12:09a	11:53p
25	12:50a	11:49p	11:37p
29	12:35a	11:33p	11:21p

July 2013

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8 ●	9	10	11	12	13
14	15	16 ☽	17	18	19	20
21	22 ○	23	24	25	26	27
28 ☾	29	30	31			

Asteroid for July 2013 (6) Hebe

Date	Transits	RA hr. min	Dec. deg.	Alt.	Azm	Magnitude
		topocentric				
1	10 : 32 pm	15 : 49.2	+00.1	45º	210º	10.0
7	10 : 06 pm	15 : 46.8	-00.4	41	218	10.1
13	9 : 41 pm	15 : 45.3	-01.1	38	225	10.1
19	9 : 17 pm	15 : 44.8	-01.9	34	230	10.2
25	8 : 54 pm	15 : 45.2	-02.7	30	235	10.3
31	8 : 32 pm	15 : 46.4	-03.5	25	240	10.4
		(at midnight)		*(at midnight)*		

Variable Star of the Month: **U Vul** 6.7-7.5 7.9906 days

Celestial Highlights

Date	UT hr	
2	01	Pluto at opposition
3	19	Venus in M-44
5	21	Jupiter 1.1º S. of M-35
8	07	**NEW MOON**
9	00	Mira at max. 3.5 mag.
16	03	**FIRST QUARTER MOON**
20	00	Flora at opposition- 8.7m.
22	18	**FULL MOON**
22	05	Mars 0.8º N of Jupiter
29	18	**LAST QUARTER MOON**
29	03	delta Aqrds. moon-56%
30	09	Mercury 20º W elongation

LUNAR OCCULTATIONS FOR: JULY 2013

Civil (24hr) date	hr	min	sec	***UT*** date	hr	min	sec	Ph	Moon % illum.	Moon alt	Moon azimuth	Star name	Star Mag.	event PA	dbl./ sep.
2	2	54	47	***2***	06	54	47	**R**	29-	09º	080º	ZC 319	7.7	227º	NA
11	22	14	23	***12***	02	14	23	**D**	13+	3	275	14 SEX	6.2	111º	0.10"
14	22	27	04	***15***	02	27	04	**d**	39+	16	245	ZC 1793	8.8	039º	0.05"
15	21	40	08	***16***	01	40	08	**D**	49+	27	223	62 VIR	6.7	101º	NA
17	21	59	12	***18***	01	59	12	**D**	71+	29	198	ZC 2173	6.9	094º	NA
17	23	21	54	***18***	03	21	54	**D**	71+	21	218	ZC 2181	6.8	137º	47.0"
19	0	08	39	***19***	04	08	39	**D**	82+	21	214	ZC 2338	6.4	055º	NA
19	1	08	31	***19***	05	08	31	**D**	82+	14	226	ZC 2343	6.3	079º	NA
20	0	24	31	***20***	04	24	31	**D**	90+	24	203	XI OPH	4.4	124º	5.90"
21	23	38	40	***22***	03	38	40	**D**	99+	28	160	ZC 2846	6.7	144º	NA
28	0	49	01	***28***	04	49	01	**M**	65-	14	91	EPS PSC	4.3	158º	0.25"

at MVCO

D= disappearance. Good occultation event.

d= disappearance, the star's magnitude approaches the observing limits of 200mm objective

R= reappearance. Good occultation event

r= reappearance, the star's magnitude approaches the observing limits of 200mm objective

All disappearances (D) occur on the eastern limb (left side in the sky). Reappearances (R) always occur on the western limb.

Position Angle (PA): tells where along the west limb to watch for a reappearance.

PA is referenced to celestial north: North=0º East=90º South=180º West=270º

Occultations computed using Occult v3.6 (I.O.T.A.)

Variable star data from AAVSO. All other data computed with MICA 1800-2050 (Willman-Bell)

GALLERY.....

M-27: In the eye of the imager

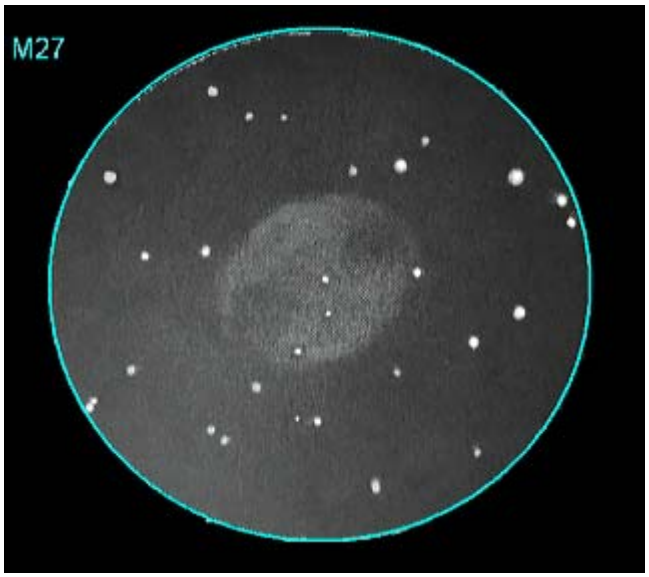
Several MVAS imagers have tried their hand at capturing The Dumbbell nebula over the years. Each person imparts their own touch or interpretation via image processing (or pencil smudge). Visually, M-27 can look a little different each time you see it. With bigger scopes you might see color or more wispy nebulosity. Maybe fainter stars. It all depends on the viewing conditions of the night as well as magnification you use. Experiment. Use light pollution (UHC or OIII) filters and take notes or sketch what you see on different nights. You'll be training yourself to be a better deep sky observer. Imagers can try different color schemes if they stack. Below are a few of the MVAS interpretations. Enjoy!

Don Durbin: Taken September 2008

Lou DiNardo: taken in September 2008

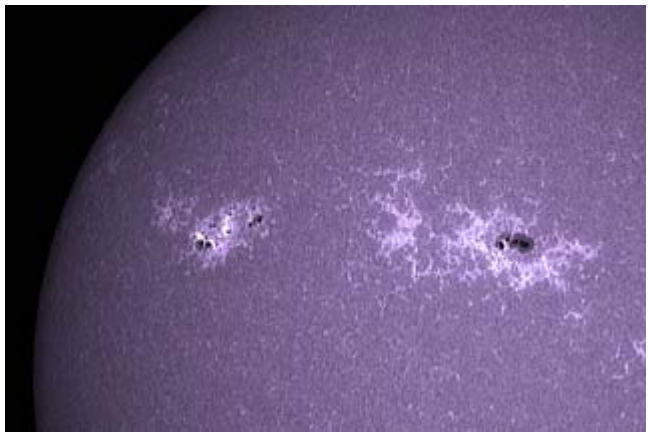
Bill Pearce: Taken September 2010

Lou Dinardo: Taken June 2009



Phil Plante: Sketched with 25", September 2010

Recent images from the MVAS…



ABOVE: Jim Haklar captured a solar flare on May 16, 2013. Image was taken in calcium (CAK) light. Flare is on left side close to limb.

ABOVE: Roy McCullough took a white light image of Sol on March 14, 2013 and an H-alpha shot (below) at about the same time.

Mike Heim captured the energetic jet (pointed at 5 o'clock position) coming for the black hole within galaxy M-87. May 4, 2013. The jet is usually not visible in amateur equipment.

Mike also captured galaxy M-98 on May 4, 2013.

Mike got this image of M-88 as well, that same night.

Good job guys! Your images save the day for this editor! Thanks for all your efforts!!!