

THE METEORITE



The Ring Nebula

M-57



Newsletter of the Mahoning Valley Astronomical Society, Inc.

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JUNE 2011

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JUNE 2011

NEWS NOTES

Newsletter of the Mahoning Valley Astronomical Society, Inc.

MVAS CALENDAR

- JUN 18** MVAS meeting at the MVCO at 8:00 PM. NOTE:
This meeting is one week early.
- JUL 9-10** YSU Festival of Arts. Public Solar viewing.
Noon till 5:00 PM, outside the Planetarium.
- JUL 23** MVAS meeting at the MVCO at 8:00 PM. NOTE:
This meeting is one week early.
- JUL 30** CAA-OTAA Meeting at Letha House.

NATIONAL & REGIONAL EVENTS

- JUN 29 - JUL 2 ALCON 2011**, The National Convention of the Astronomical League. Takes place At Ruby's Inn Convention Center, Bryce Canyon City, UT. Speakers, star parties, vendors. \$50 registration needed (for all 4 days). See website. <http://alcon.astroleague.org>
- JUL 27 - 31 Mason Dixon Star Party**, to be held at 380 Kralltown Rd. Wellsville, PA. Flat horizon viewing. Speakers, vendors, raffle. Registration \$15 or \$25 at gate. Camping fee \$10 per person, per night. <http://www.masondixonstarparty.org>
- JUL 27 - 31 Stellafane Convention**. Conducted by the Springfield Telescope Makers, on Breezy Hill at Jordan Road Springfield, VT. The *Meteorite Men*, featured speakers. <http://stellafane.org/convention>

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A True Spirit. NASA has ended operational planning activities for the Mars rover Spirit. The Mars Exploration Rover Project will now focus on Spirit's still-active twin, Opportunity. This marks the completion of one of the most successful missions of interplanetary exploration ever launched. Spirit was parked at a location west of a low plateau called Home Plate. Spirit last communicated with the NASA/JPL team on March 22, 2010, as Martian winter approached and the rover's solar-energy supply declined. At that time, Spirit was sent a restart schedule and then placed in hibernation mode. NASA checked frequently in recent months for a reawakening as the available solar energy increased during Martian spring. The scheduled turn-on and radio contact times passed with no signals received from the rover. The rover operated for more than six years after it landed in January 2004. It was planned as a three-month mission.

Spirit drove 4.8 miles, more than 12 times the goal set for the mission. It crossed a plain to reach a distant range of hills that appeared as mere bumps on the horizon from the landing site. It climbed slopes up to 30 degrees as Spirit became the first robot to summit a hill on another planet. It covered more than half a mile after Spirit's right-front wheel became immobile in 2006. The rover returned more than 124,000 images. It ground the surfaces off 15 rock targets and scoured 92 targets with a brush to prepare the targets for inspection with spectrometers and a microscopic imager. One major finding came, ironically, from dragging the inoperable right-front wheel as the rover was driving backwards in 2007. That wheel plowed up bright white soil. Spirit's Alpha Particle X-ray Spectrometer and Miniature Thermal Emission Spectrometer revealed that the bright material was nearly pure silica. This showed that there were once hot springs or steam vents at the Spirit site, which could have provided favorable conditions for microbial life. Team leader Steve Squires summed it up. "...a fairly simple geologic experiment on Mars ultimately turned into humanity's first real overland expedition across another planet. Spirit explored just as we would have, seeing a distant hill, climbing it, and showing us the vista from the summit. And she did it in a way that allowed everyone on Earth to be part of the adventure."

Catch a falling star. The Draconid meteor shower is expected to produce unusually high peak meteor rates of 1,000 per hour on October 8, 2011. Normally the Draconids are a weak shower producing 10 meteors per hour. However, this shower has been strongly variable in the past. In 1933 and 1946, the Draconids produced "meteor storms" where meteors appeared at rates of 10,000 per hour or more. Lesser outbursts, that had counts into the hundreds per hour occurred in 1952, 1985, and 1998. The 2011 Draconid outburst is expected to occur between 17:00 and 18:00 Universal Time on Saturday, October 8, 2011. Unfortunately this translates to between 1 and 2 pm Eastern Daylight Time. This means that the peak of the shower occurs during daylight in North America. The best locations from which to view the shower peak will be Europe, North Africa, and the Middle East. Though the peak of the outburst will occur during daylight, the shower is expected to continue producing meteors, but at a reduced level, into the evening of October 8. So Eastern USA observers will still have a chance to see perhaps some of the meteor shower; but the Moon is 3 days before full. (sources- all above from Space News)

MINUTES OF THE MAY MEETING

MAY 28, 2011 at the MVCO

The meeting came to order at 8:00 PM with President Sam DiRocco presiding. Roll call was taken with 21 members giving the password. Virginia, Lisa, and Isaac were the regular guests. Robert Leveus from Vienna, OH stopped by to see what we had going on. He often visits with the Oil City group and is considering an MVAS membership since we are closer. Former MVAS President Greg Klocek and his wife Jill were also on site to attend the BBQ after the meeting. A Call for the Reading of the Minutes was made. Greg Higgins moved to suspend the reading. Rosemary Chomos seconded the motion. With no further discussion, the Minutes were accepted as published by a unanimous voice vote.

TREASURER'S REPORT: The Report was read by Steve Bartos. He noted that he has renewed the MVAS status with the IRS as a non-profit organization (501-3C). This is a normal periodic requirement. He said that if we have over \$50,000 in revenue next year there would be additional paper work required. It did not appear that this would be an issue. On a motion by Greg Higgins to accept the Report with a second from Dan Schneider, the motion was adopted and the Report was accepted as read.

General Fund 4/1 thru 4/30 2011

OPENING BALANCE:	\$	11,637.69
CLOSING BALANCE:	\$	10,794.12
ACCOUNT NET GAIN/LOSS FOR THIS PERIOD:	\$	-843.57

INCOME:

INTEREST	\$	<u>0.97</u>
TOTAL INCOME	\$	0.97

EXPENSES:

CK# 2751 EXTENSION CORDS	\$	82.59
2752 MVAS CLOTHING (RE-STOCK)		686.00
2753 EXTENSION CORD		9.00
2754 SKY & TEL & ASTRONOMY RENEWALS	\$	<u>66.95</u>
TOTAL EXPENSES	\$	844.54

Reserved Funds

KEY DEPOSITS	\$	250.00
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RESERVED FUNDS ADDENDUM - NOT GIVEN IN ABOVE REPORT.

YTD 50" PROCEEDS RESERVED FOR OAD FUND (LAND)	\$	3,500.00
CASH FROM ORIGINAL OAD FUND (ALSO FOR LAND)	\$	3,914.12
FUNDS AVAILABLE FOR MVAS OPERATIONS	\$	3,070.55

CORRESPONDENCE: Bob Danko said we received the usual NASA literature (posters, etc.) from Night Sky Network, but had left it at home. There was also normal junk mail which was tossed. We still get junk mail addressed to the previous P.O. Box owner (now deceased)

COMMITTEE/OFFICER REPORTS: *Imaging Committee:* No Reports. *Visual Committee:* Phil had one page completed. Sam said he had 2 pages to turn in but they were sitting at home. No Homework was turned in. With luck, weather will be improving, it's time to get out observing and filling out reports or imaging.

OBSERVATORY DIRECTOR'S REPORT: First off, Larry Plante said everything is wet. But buildings and equipment seem to be holding up well at the MVCO. The outhouse is really full now with run-off rain water. It will need pumped out much sooner than previously thought. The PVC plumbing for the well

system had cracked over winter. He repaired it several times with PVC, each time a new crack appeared. He ended up replacing everything with galvanized pipe and fittings. Greg suggested we move the well line next to the building and anchor it against the building. This would eliminate flexure and vibrations that are the likely cause of the PVC failure. This would involve some digging. A few recounted the hot day in 2001 when the well head had to be dug-up so that a new line and pump could be installed.

OLD BUSINESS: Phil went over some upcoming MVAS events. The YSU folks are actively looking for MVAS volunteers to help run the solar scopes (including an H-alpha scope) outside of the Planetarium during the Summer Festival of Arts. Planetarium shows will be running during the Festival (July 9 and 10). The Festival is from noon till 5:00 PM both days. With enough people, scope operators can take turns breaking in the planetarium air conditioning or hitting the food vendors. So far Jodi and Roy committed to helping on at least Saturday. Bill and Phil were also possibilities. We are reminded that Chagrin's OTAA was the next weekend (June 4). There was a short discussion about getting some of us up there. Phil noted that the June (next) MVAS business meeting will be a week early. The week after that will be our summer Scenic Vista event. Rocket flying in the afternoon will depend on weather conditions. Otherwise it is a regular public night, starting at sunset.

Greg Higgins said we need to get gravel for the drive sooner than later. There was a discussion on how much we got the last time. Bob seemed to think we got 15 tons. The vendor was also discussed. There were a few near the MVCO. Beckers is apparently the supplier we used last time. Larry will get price quotes. It was advised not to get the pea sized gravel as this disappears quickly. The idea will be to have the driver "tail-gate" the load along the drive instead of dumping it in one pile. This makes spreading and leveling the gravel a manageable chore. There was no reply from the 50" mirror buyer when Bill called earlier. He still owes \$1,500.00 upon pick-up of the mirror. This was to have occurred by this spring. There didn't seem to be much concern since he has already sent \$3,500 towards the purchase. The ground may still be too wet to use a fork lift.

NEW BUSINESS: Greg pointed out that the gutters need addressed as soon as possible. Sam recommends we hire a professional installer. They would replace the fascia, gutters and hangers. The current gutters are leaking in several places with the worst one (buckled gutter) over the new foundation repair. The concrete there is already showing signs of erosion with gravel within the concrete starting to show. We spent a hefty amount of cash on repairing the water damaged foundation. We need to ensure it is not destroyed again from water damage. Mike Boyer is having similar gutter work done at home and will see about getting material estimates and pricing for the work at the MVCO. Once this information is available for discussion, action can be taken (a motion made) to begin the repairs.

Sam reported that at the last Trustee meeting it was decided to have a slight change in the way the main OTAA raffle prize drawing was conducted. There have been complaints from other OTAA attendees, that only MVAS members seem to win. Some appear to do this by "out-buying" other attendees. In an effort to level the field, the Trustees felt that any person could only have one win. There was a confusion that there was a "Grand Prize". But in fact we usually have three or four Main prizes, Chinese style drawing. Play for the prize you want most. Greg complained that this didn't matter and it was discriminating

against those that spend the money. A ticket limit didn't have a favorable response. After some debate, it was decided to put all main prize tickets in one "pot" (Greg's idea). Winners will pick the main prize that they want (from those remaining) as is done in the door prize drawings. No limit to prize winning. We have usually had at least 3 main prizes of equal value. Occasionally one big prize has been offered. The Chinese style raffle was initiated some years ago to allow players to play for only the prize they were most interested in. So far this year we have a Televue 19mm Panoptic as one prize. Sam and Harry are working on a second prize. Tony is working on a third. These should be enough for this raffle. Please start collecting items for use as door prizes. Thanks in advance.

GOOD OF THE SOCIETY: Jodi and Roy made a trip to Rome, Italy recently. They contacted Brother Guy, and he gave them a tour of the Vatican Observatory. They had some images of the tour, which they showed on the 42" monitor during the BBQ. Harry was going to give a presentation on the local light pollution related to our search for land. But this was postponed. Cell-phone weather maps were showing a storm getting close to the area, so the meeting was sped-up to get the BBQ in before the rain got there. Harry noted there were no viable (affordable) land prospects at this time, so nothing urgent needed to be discussed.

VISUAL REPORTS: Quickly Greg reported some galaxy hunting at the MVCO and Roy did some solar imaging.

ADJOURNMENT: Adjournment came at 8:44 PM. We thank all those that brought food for the BBQ. Pandian's lemon rice and curried chicken were tops as always. Equally good were Jodi's four bean salad and Larry's burgers, hot dogs and monster steaks. Add Bill's stuffed jalapeño's and Greg's pork roast to that list. Tasty. The next meeting will be at the MVCO on June 18, 2011. (One week early) Meeting begins at 8:00 PM. Scheduled hosts are Keith Janeco and Larry Plante.
PASSWORD: name a lunar crater. *-minutes by Phil Plante*

MVAS REMINDERS

There is a fully stocked supply of MVAS clothing on hand now. Several shirts were sold prior to the meeting in May. All tee shirts are \$10 each. All other shirts and hoodies are \$25 each. Ball caps are \$10 each and knit hats are \$12 each. 3X and 2X shirt sizes are limited in number and shirt style. See Steve to see what is currently available, as these special sizes are harder to keep in stock. Either no one is buying them or they sell-out within a month. We order only when "normal size" stock becomes low and there have been enough requests to warrant a new order. Waiting to order helps amortize production costs; such as the \$5 screen reset charge for any one production run. It's the same charge for 5 t's or for 50 t's. So it's frugal for MVAS to spread such a cost over as many items as possible.

Remember that for the rest of 2011, we've moved up by one week, all MVAS business meetings. This "early" schedule starts in June and runs through September. This was done to avoid our meetings conflicting with other OTAA conventions and also allowing for some decent Scenic Vista Public Nights with limited Moon interference. This early schedule also ties in nicely with the October, November and December meetings which by tradition have been a week early due to the Holidays. In 2012 we expect to go back to last Saturday meetings as the Moon phase turns out to be a friendlier aspect to calendar planning.

You still have some time to pay your 2011 MVAS dues. It's \$30 a year (for 2011). Margie Dimoff was left of the list of paid-up members given in the last issue. Apologies to Margie and to anyone else that was missed. Remember, next year the rates go up to \$40 per year. But then you won't feel obligated to buy \$50 in Christmas Raffle tickets anymore.

MVAS ACTIVITIES

The OTAA Scenic Vista Stargaze was another rained-out event on May 7th. About a half dozen of the usual suspects came down in the afternoon and had a relaxing time in the pavilion. Joyce and her lady friends from the Campfire Girls renewed their lunch stand from days gone by. They weren't selling food for the Campfire Girls anymore, but some of the proceeds and leftovers were donated to a church group. The yummy homemade food consisted of chili, bean and ham soup, pies, brownies and cakes. Hot dogs and pop rounded out their menu. We thank Rosemary for the bagels and cream cheese.

It was a nice picnic on all accounts. It was also most convenient to just lug down the cash one would have spent on buying supplies. Instead you just bought the food they had there, already cooked! We were all looking forward to a great night under clear, dark skies. But we all know how 2011 has gone regarding rainfall. With no obvious signs of clearing up soon, everyone was gone by 6:30 PM, with sprinkles adorning the windshield. A few days later, I heard one of our members was there later that night. He reported clear skies but no one else was there. In any case, the security light was on all day and the breaker box is now locked. No way to shut it off. Wonder how a star party would have gone? We'll need to address this with the Park before the June Public Night. This is also something to keep in mind if you go down there to observe on your own. Better luck next year.

Observer's Notes.....

Diamonds in the Rough

Stellar Evolution: Stars shine by the process of nuclear fusion. At their cores, the intense pressure and high temperatures smash (fuse) four protons (aka: hydrogen nuclei) into a helium nucleus. It does this at a rate of about 400 tons of hydrogen per second, releasing gobs of radiation energy (see $E=mc^2$). As a star ages, it depletes the core supply of hydrogen; having fused it all into helium. As this happens the outward pressure of "fusion energy" slowly weakens against the inward pull of gravity. In time gravity wins-out, pulling and pressing the outer layers inward. Structured like the layers in an onion, the layer- or shell- of hydrogen surrounding the helium core eventually gets compressed enough to begin hydrogen fusion. This shell "burning" causes the star's outer layers to expand again; this time it swells into a red giant star or even a super giant star in the case of the most massive stars. During this red giant phase, the core becomes hot enough to allow the helium to fuse into carbon. In low mass stars, the helium turn-on is more sudden (called the helium flash). In higher mass stars the helium fusion turns on more slowly.

After this helium/ red giant phase begins, the star struggles to maintain a balance between inward (gravity) and outward (fusion) pressures. It fluctuates in size and luminosity- thus becoming a variable star. Red giant stars of 1.5 solar mass or less can never heat up enough to fuse the carbon that was formed from helium fusion. More massive red giants can begin

carbon fusion. Nitrogen and oxygen will also form as by-products of carbon fusion. Over time, red giants slowly lose (puff-away) their outer layers due to those variable star pulsations. Meanwhile, convective currents in the star's interior dredge up materials from the core. These get mixed into the surface layers and are blown off as part of the stellar wind. The convection action can be mild or very extreme. In the end, a hot core remains at the center of an expanding shell of star stuff. The core slowly cools becoming a white dwarf star- about the size of Earth. High energy photons from the white dwarf illuminate and fluoresce the still expanding shell of material. A planetary nebula is thus formed. This is the fate of our own Sun.

Super giant stars on the other hand continue in a series of contractions and heating in which elements heavier than nitrogen begin to fuse in the core and surrounding shells. Until iron remains. When this stage is reached, fusion stops and the core abruptly collapses in seconds. The outer layers crash down onto the core. These layers explosively recoil forming a supernova. Under the extreme and brief supernova implosions, the temperature and pressure are such that elements heavier than iron can be formed. The supernova leaves behind a neutron star / pulsar. This illuminates the surrounding material which we call a supernova remnant. In the case of a progenitor star of 3 solar masses or more, a black hole is left after the supernova. The core material gets compressed into a singularity; a point in space-time that has no size. Strange things happen now! We'll stop here at Black Holes. A stellar evolution topic for another installment of *Observer's Notes*.

A carbon star is a rare class of an old red giant star. It has a higher than normal carbon to oxygen ratio in the outer atmosphere. They also have a fairly low surface temperature (2000 – 3000k). Two types are now recognized.

Classical Carbon Star: It produces its carbon internally by the helium fusion in its core. Much of this carbon material is "dredged-up" by highly active convective currents. The star expels this carbon-rich material mixed with its normal stellar wind. It then readily mixes with the surrounding interstellar environment; so much so, that most of the carbon throughout the Milky Way comes from mass-losing carbon stars. Some of the carbon "soot" that remains near the star's surface absorbs most of the stars' blue light, thus making the star appear very red. The soot consists of molecular carbon (C₂), carbon monoxide (CO), cyanogen (CN) and other carbon compounds. Lithium and barium are also abundant.

A Non-Classical Carbon Star: It is part of a binary system. They captured their surface carbon material from their companion star- back when it was once a classical carbon star. The companion is now a white dwarf.

All carbon stars are also variable stars. They have semi-regular or irregular periods. Carbon stars are currently classified as "C" stars. They used to be split into two Harvard classifications: "N" and "R". A new revised Morgan-Keenan (M-K) carbon star classification was published in 1993. It defined the classes of: C-N, C-R, C-H, C-J and C-Hd. This is the official classification system in use today. Classical carbon stars fall under C-N and C-R classifications. Next, the C-J, C-H, and C-Hd classifications describe non-classical carbon stars. Carbon stars have two numbers assigned to them. The first number ranks its temperature and the second number indicates the strength of its carbon spectral bands, on a scale of 1 to 5. The higher this number, the more reddish the star will appear.

Most modern lists of carbon stars will classify a carbon star in the new M-K "C" System, listing both temperature and carbon

abundance. Some lists still utilize the older Harvard classification. There is a handy list of carbon stars in the *2011 RASC Handbook* (pg. 302) using the old Harvard classification. But this is the first RASC issue to have this list.

T Lyrae is our variable star this month (check the Homework chart). It's one of the top 3 reddest stars easily visible. The new M-K system has it listed as: **C-J 6,5**. It's a carbon star of about 2780K°, with the highest carbon band strength of 5. So, T Lyrae is indeed a very red star. It is of course a variable star as well. Putting this all together as it would look on a modern M-K list:

Star	Spectrum	Mag(v) Range	Period
T Lyrae	C-J 6,5	7.5 – 9.6	Irreg.

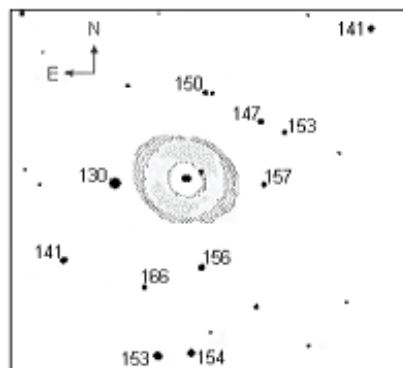
Just for a moment, let's forget the stellar evolution info given above. It's time to contemplate just what we are looking at! Now...if carbon stars populate the Milky Way with most of the carbon atoms to be found, then we must first realize that this carbon is also the stardust that makes us! All of our carbon "stuff" has been forged from the rough, into the gems of the universe. Carbon containing "gems" like our DNA. And there is carbon in our food, the forests, the air, the rocks, the pencils that take our notes, the fossil fuels that propel society, and in the diamond gemstones that support fashion, economies and industry. Past carbon stars made all this possible. The main thing, though, is that Earth has carbon based life. We like to think this miracle is possible elsewhere in the cosmos. When we look at a carbon star, we bear witness to, or at least we can imagine, the elements being fused that may one day produce another carbon based life-form. At once: it's an example of where our carbon roots came from and also a glimpse of how our own Sun will end as a red giant. Take a look at a carbon star! It is well stated in the lyrics of "Woodstock", that old Joni Mitchell song. Poetic advice for all, which says:

"We are stardust, we are golden, we are billion year old carbon, And we got to get ourselves back to the garden."

Get out in a back yard, the MVCO or wherever your "garden" is. Scope-out T Lyr. You'll be amazed how red it is. Perhaps you might also perceive how special it is. -P. Plante

MVAS Homework: The Ring Nebula

Spotting the Ring's central star is notoriously hard. The best conditions of seeing and transparency are needed, along with a big scope. The magnitudes of field stars near M57 are given in the chart below (from A. Hendon -USNO). Experts say that the two faint stars outside of the Ring (at magnitudes 14.1 and 14.7) need to be visible if there is to be any hope of seeing the central star. A telescope 14" or bigger is usually needed. But then, the central nebulosity of M57 gets brighter making detection of the central star even more difficult. Using high magnification is also needed to flush out the star. The central star has been glimpsed in the MVAS 25" on a "good" night. The 15.4 mag. star was this scribes' best shot, but no central star. How deep can you go?



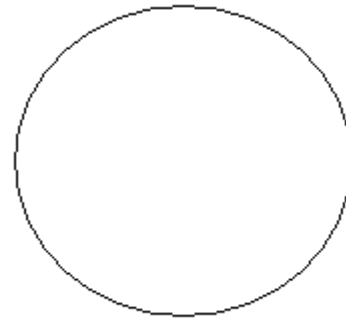
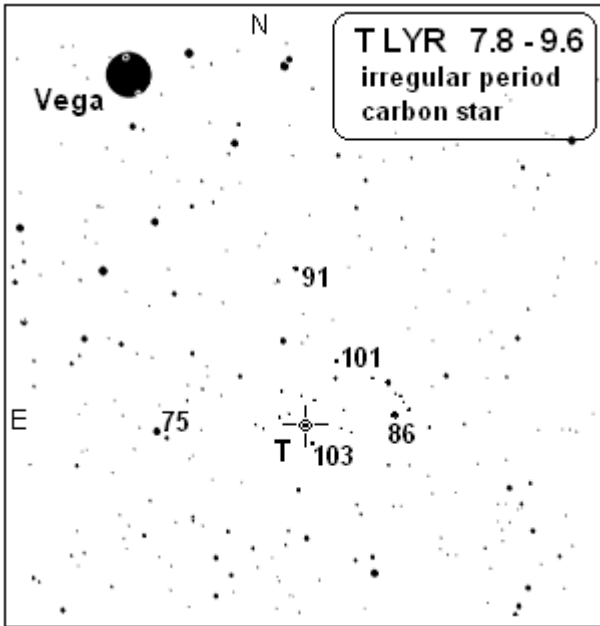
MVAS OBSERVER CHARTS

MVAS OBSERVATIONS - DUE AUGUST 2011

Variable star of the month: **T Lyrae** (*abbrev:* T Lyr). Not an easy find at first. But it gets easier each time. A telescope is advised. Star hop from Vega, which should still be in a finder scope field (near the edge), with T Lyr just opposite the center from Vega. When at minimum light is harder to spot having a muted red light. Near maximum it stands out well. At last check on June 3rd 2011, it was around 9th magnitude. You'll have until the leaves turn red and fall, to follow its red light changes. The more you stare at it, the brighter and redder it gets

OBSERVER _____

Featured object: M-57 . Please try a sketch. Remember that the circle is the eyepiece field. First, faintly draw the outline of the Ring, then the inner boundary. Try to place this accurately. Shade the nebulosity: use heavier graphite (for bright) or lighter (for dim). Smudge with finger as needed. Pencil point the stars in the field. The main thing is to get something on paper recording your observation. Please turn in Homework. Thanks!



M-57 Observation:

Date: _____ Time(EDT) _____ Scope _____

T Lyr magnitude estimates:

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

_____	_____	_____	_____
_____	_____	_____	_____

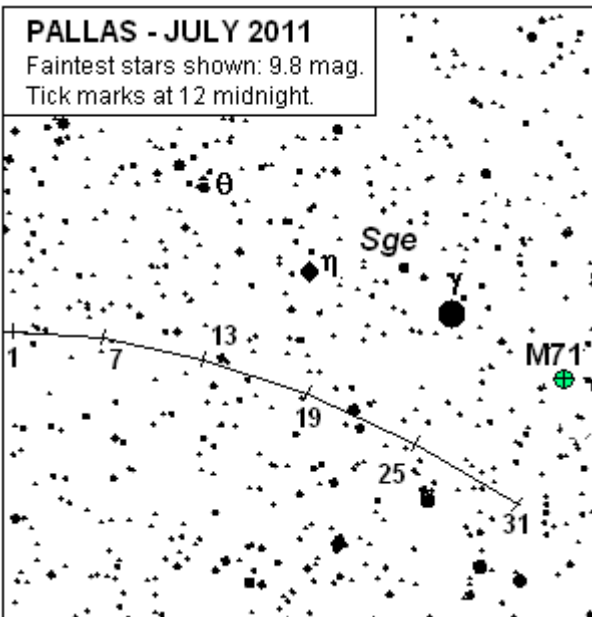
(2) Pallas Observations:

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

_____	_____	_____	_____
_____	_____	_____	_____

Asteroid of the month: **(2) Pallas**. This is the last month that we'll follow Pallas this year. It barely rises in brightness from 9.7 to 9.5 magnitude during July. It ends the month south of M71, which is a nice globular to take a peek at. Pallas also gets higher in the SE at midnight, as July progresses. A nice hunt for small scopes. Good luck and let us know how you did.

Other Objects in Lyra to observe

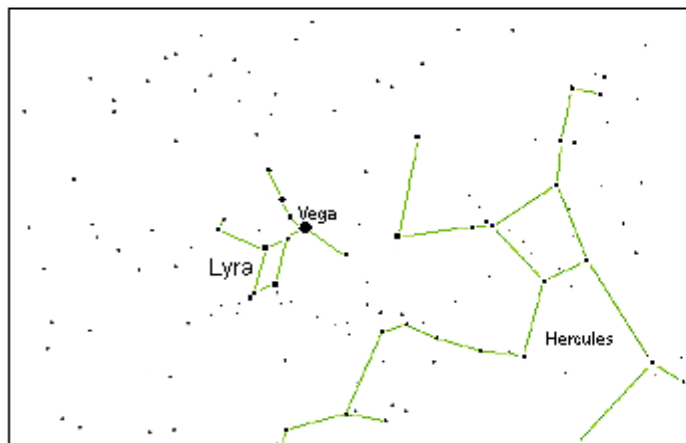


D. Sky	Date	Scope	Dbl.	Date	Scope	SEP	MAG	SPLIT?
M- 56	_____	_____	ε ^l Lyr	_____	_____	2.1"	5.0 - 6.1	Y / N
N- 6791	_____	_____	ΟΣ 525	_____	_____	45.0"	6.1 - 7.6	Y / N
Steph 1	_____	_____	η Lyr	_____	_____	21.8"	4.4 - 8.6	Y / N

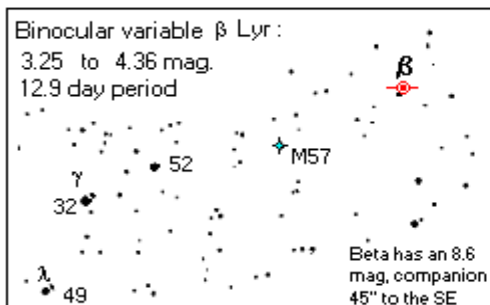
Lunar Occultations (see Sky Almanac):

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

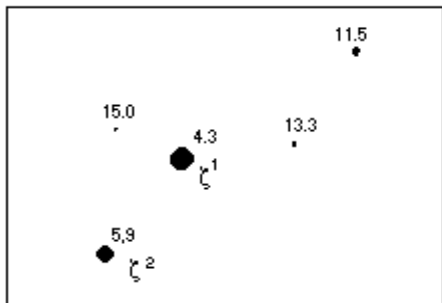
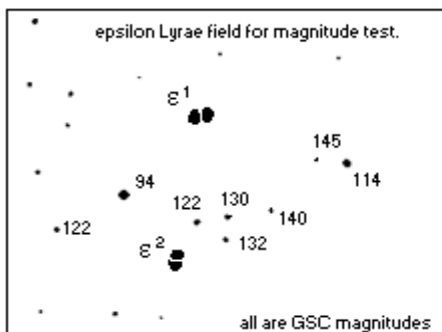
Constellation of the Month — Lyra



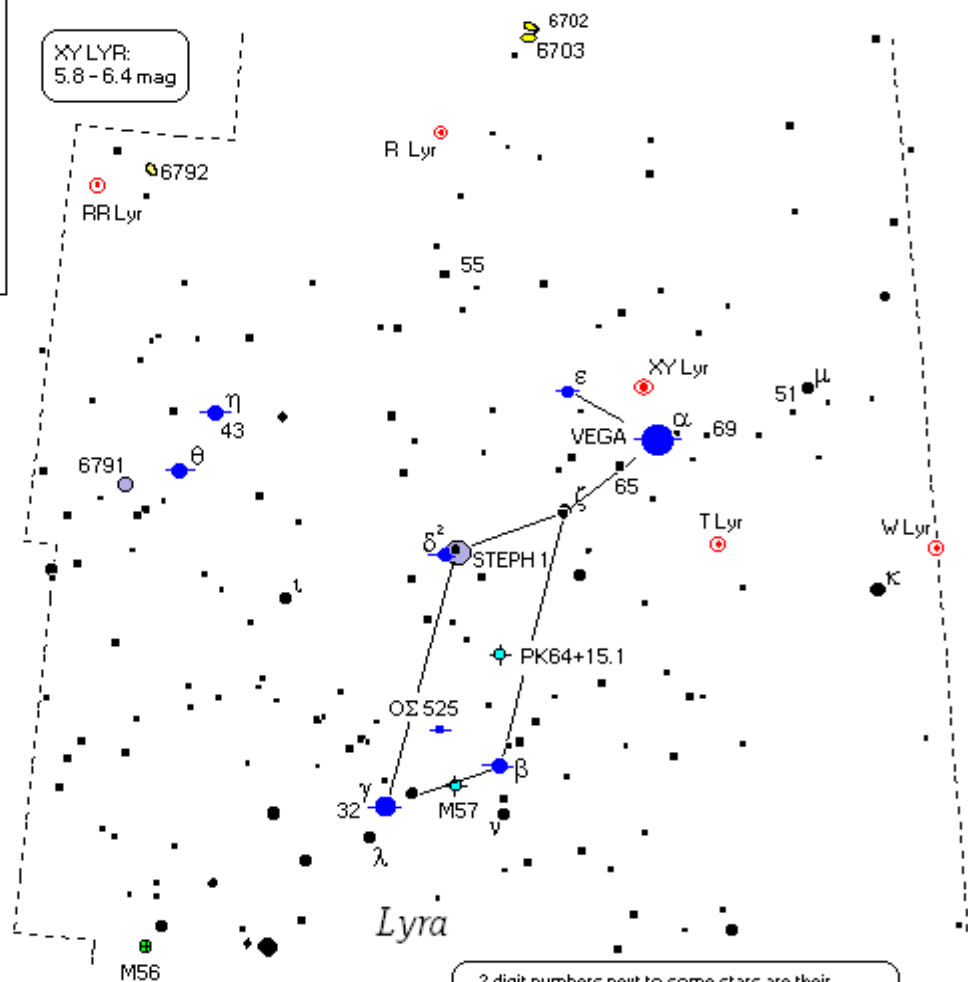
Blue-white Vega is the brightest star in the area and star of Lyra. Vega is your reference point in tracing out Lyra. Test your eyes on epsilon to see if you can split it. It's easy with binoculars. In a telescope you should be able to split both components as they are doubles in their own right. Use the epsilon chart below to see how faint you can see with your scope. There are a few other interesting doubles to spy on. Zeta is nice in binoculars and look for the sparse open cluster Steph 1 around delta. There are several binocular variables to follow: R, XY, and beta Lyr. You can use the magnitudes given on the main chart for comparison. A few galaxies are shown and these are the brightest. Those with big light buckets could use an atlas like Uranometria to hunt down many more in this constellation. Most are 14th mag. or fainter. The Ring Nebula (M57) is the showpiece object for deep sky fans. In binoculars it looks like a bluish-grey star. Use a scope to crank up the power. M56 is a nice globular to look in on too. PK64+15.1 is a planetary half as big as M57 and it's fainter. Can you find it? There is plenty to see and many observing challenges in this tiny constellation. Give Lyra some observing time and be sure to let us know what you were able to find.



XY LYR:
5.8 - 6.4 mag



ζ^1 also has faint companions of 11.5, 13.5 and 15.0 mag.



2 digit numbers next to some stars are their magnitudes. Use them for variable star estimates.

DEEP SKY				DOUBLE STARS			Check list		Instruments used: _____ on _____ _____ on _____ _____ on _____ _____ on _____
M56	8.4 mag.	7' dia.	Globular	$\text{O}\Sigma$ 525	6.1, 7.9 mag.	45" sep.	_____ $\text{O}\Sigma$ 525		
M57	9.7	63"	Planetary	ϵ^1	5.0, 6.1	2.6"	_____ ϵ^1		
N6791	9.5	15'	Open Cl.	ϵ^2	5.2, 5.5	2.3"	_____ ϵ^2		
STEPH1	3.8	20'	Open Cl.	$\zeta^{1,2}$	4.3, 5.9	44"	_____ $\zeta^{1,2}$		
PK64+15.1	12.8	36"	Planetary	δ^1	5.6, 9.3	175"	_____ δ^1		
N6792	12.9	2' x 1'	Galaxy	δ^2	4.5, 11.3	83"	_____ δ^2		
N6703	12.3	2' x 2'	Galaxy	η	4.4, 8.6	28"	_____ η		
VARIABLE STAR				θ	4.4, 9.1	99"	_____ θ		
R LYRA	3.8 to 5.0 mag. 46 day period						R Lyr _____ mag. on _____	_____ mag. on _____	

Solar and Lunar (EDT).

Date	Sunset	Moonrise	Moonset
1	9 : 01	x : xx	9 : 17p
5	9 : 00	x : xx	11 : 30p
9	8 : 59	x : xx	1 : 03a
13	8 : 57	x : xx	4 : 17a
17	8 : 54	10 : 05p	x : xx
21	8 : 51	11 : 43p	x : xx
25	8 : 48	1 : 19a	x : xx
29	8 : 44	4 : 59a	x : xx

PLANET WATCH

Mercury Sets	Saturn Sets	Pluto Transits
10:20 PM	1:28 AM	1:14 AM
10:23 PM	1:12 AM	12:58 AM
10:22 PM	12:57 AM	12:42 AM
10:18 PM	12:41 AM	12:26 AM
10:11 PM	12:26 AM	12:10 AM
10:02 PM	12:11 AM	11:49 PM
9:49 PM	11:52 PM	11:33 PM
9:34 PM	11:37 PM	11:17 PM

July 2011						
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 2011 (2) Pallas

Date	TRANSITS	RA		Alt.	Azm	Magnitude
		hr.	min deg.			
		<i>topocentric</i>				
1	3 : 07 AM	20	19.3 +19.4	45°	104°	9.7
7	2 : 39 AM	20	15.1 +19.3	50	111	9.7
13	2 : 11 AM	20	10.6 +19.1	54	118	9.6
19	1 : 43 AM	20	05.9 +18.7	58	128	9.6
25	1 : 11 AM	20	01.1 +18.2	62	140	9.5
31	12 : 46 AM	19	56.3 +17.5	64	154	9.5

Variable Star of the Month: **T Lyr** 7.8 - 9.6 mag carbon star, irr.

Date UT hr **Celestial Highlights**

1	08	NEW MOON
4	00	SS Virgo max: 6.8 mag.
6	21	Mercury 0.3° S. of M44
8	06	FIRST QUARTER MOON
12	22	Neptune's Birthday
15	06	FULL MOON
20	05	Mercury greatest 27° E.
23	05	LAST QUARTER MOON
28	15	delta Aqr meteor shw r.
29	14	Pallas at opposition

LUNAR OCCULTATIONS FOR: JULY 2011

Civil (24hr) date	UT			Moon Ph	Moon % illum.	Moon alt	Moon azimuth	Star name	Star Mag.	event PA	dbl./ sep.				
	hr	min	sec												
8	21	28	49	9	01	28	49	D	59+	29°	207°	ZC 1944	5.5	122°	80.0"
12	22	04	17	13	02	04	17	D	95+	22	158	ZC 2523	4.8	052°	NA
22	5	15	29	22	09	15	29	R	58-	56	145	ZC 163	7.3	244°	8.5"
25	2	02	51	25	06	02	51	R	30-	6	68	ZC 500	7.1	219°	6.9"
25	2	31	40	25	06	31	40	R	30-	11	72	ZC 503	7.3	245°	NA
25	3	40	16	25	07	40	16	R	30-	24	72	SAO 75971	8.1	239°	NA
26	3	56	18	26	07	56	18	R	21-	18	76	67 TAU	5.3	223°	340.0"
26	4	02	07	26	08	02	07	R	21-	19	77	kappTAU	4.2	246°	5.4"

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=0° East=90° South=180° West=270°

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.....

OTAA Scenic Vista Stargaze

Everyone knows we've had a wet spring and this day was no different. Early afternoon teased us with a few patches of blue sky. By 4:00 PM it was raining off and on.



Two vehicles made it to the observing area, for a while. They moved to the parking lot once the rain started. The ground was pretty soft and observing there might have been a messy problem if it had cleared out. Maybe the rain served a purpose.



Joyce and the food crew showed up with tasty chili and hot dogs to buy. Homemade pie to finish. This was much more convenient than bringing picnic stuff down.



Desperate for something celestial to observe, the editor imagined the scene above as looking at a rare open cluster made of white dwarf stars, nestled within a dandelion asterism of yellow super giant stars. (huh?)



Rain, rain, go away. Come again on a full moon day (night).



Despite the bad weather, it was a good time to chat about MVAS things and other topics. Above, MVAS "Big Wigs" discuss the airspeed velocity of an un-laden swallow. Others took solace in the quiet park setting to unwind with a cool beverage. Who wouldn't like that? So. Even a rainy day can't ruin a good time when MVAS folk get together. The 2012 Stargaze looks like it will be on May 19. It's a New Moon on the 20th with an annular eclipse ...but only to be seen way out west.



Chagrin OTAA Meeting: June 4, 2011

At Indian Hill Observatory.....



MVAS arrives by 6:00 PM and claims a table at the IHO. It was another warm, humid night with -you guessed it- rain in the forecast. *Below:* Time to chat, while other OTAA folks show up.



Waiting. Waiting. MVAS readies for the food attack.



Sam - 2012.



Fire in the hole. Hot dogs on the way.

ROAD TRIP

After CVAS proceedings, most attendees car pooled 3 miles up Clay St. to Telescope Park. What an impressive astronomy facility. It's still under construction. The group next toured the Nassau Astronomical Station and its 32" Cass. Impressive. More photos of this side-trip will be in the next issue of the *Meteorite*.



(L) Rosemary, Dan and Fred hitch a ride.



(L) Group walking up to the Telescope Park facility. Building on left houses the Norm Oberle 25" telescope.



Once the hot dogs were done the feast was on. Food was still coming in at this point. Eventually some cheese cake "cupcakes" things showed up. This reporter passed but the word was they were good. Afterward, CVAS's Bob Modic gave a report on the June sky including a supernova in M-51- currently at 14th mag. It was a great night.

