THE METEORITE

Messier-4

(NGC 6121)

Globular Cluster in Scorpius

ESO 2.2m Max Plank Telescope, LaSille Obs. - Chile

Newsletter of the Mahoning Valley Astronomical Society, Inc.

MAY 2013

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MAY 2013

MVAS CALENDAR

MAY 11 OTAA-Scenic Vista Stargaze. 7:30 PM set-up.

MAY 25 Business meeting at the MVCO 8:00 PM. This is a BBQ night. Please bring your grilling foods, drinks and sides. You are welcome to share.

JUN 15 Scenic Vista regular public night. Sunset 9:00 PM

JUN 29 Business meeting at the MVCO. 8:00 PM

NATIONAL & REGIONAL EVENTS

JUN 14-15 **Stars Over Yellowstone**, Yellowstone National Park, Madison Campground, WY. An outreach program open for public star viewing. 200 People on average attend lecture and telescope viewing sessions. Park admission and camping fees apply. Star Party is free. http://smasweb.org/?page_id=546

JUL 10-14 **Mason Dixon Star Party.** Held at the Shreveport North Airport, Wellsville, PA. Fees updated on website. Guest speakers, vendors, a raffle, and the pool will be open. A food vendor will be at the star party Friday evening to Sunday morning. http://www.masondixonstarparty.org/

JUL 11-14 **Sky Tour.** Will be held on Bismark Rd. in Bellevue, OH. Fees: $20 per person or $30 for couples and groups of 3 or more. Sky Tour is now in its 15th year and is held at an observing field approx 5 mi. south of Bellevue Ohio on St. Rt. 4. Please visit the web site for details. http://nwo-astronomy.org

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

NEWS NOTES

Hot Spots. A new image of Betelgeuse taken by the e-MERLIN radio telescope array at Jodrell Bank Observatory in Cheshire, UK shows unexpected regions of hot gas in its outer atmosphere as well as a cooler arc of gas that weighs almost as much as the Earth. The image of Betelgeuse shows that its atmosphere extends out to five times the size of the visual surface of the star. The hot spots appear on opposite sides of the star, separated by about half the visual diameter of the star. They have a temperature of about 4,000-5,000 Kelvin. Higher than the average temperature of the radio surface of the star (about 1,200 Kelvin). The visual surface is 3,600 Kelvin.

The arc of cool gas lies almost 7.4 billion kilometers away from the star -- about the same distance as the farthest Pluto gets from the Sun. It is estimated to have a mass almost two thirds that of the Earth and a temperature of about 150 Kelvin. The mechanism by which supergiant stars like Betelgeuse lose matter into space is not well understood. But it is a key role in the lifecycle of matter as it enriches interstellar space. Detailed high-resolution studies of the regions around massive stars are essential to improving our understanding of the enrichment process. This is the first direct image that shows hot spots so far from the center of a star. Continued radio and microwave observations will help decide which mechanisms are most important in driving the stellar wind. Observations will also tell us how those elements that form the building blocks of life are returned to interstellar space. It will also help determine how long before Betelgeuse explodes as a supernova.

Einstein Rules Again. In a pulsar system called PSR J0348+0432, an unusually heavy neutron star spins 25 times per second. It is orbited by a white dwarf star, every two and a half hours. General relativity predicts that light is deflected by gravity. Astronomers can search for these deflections with observations. “I was observing the system with ESO's Very Large Telescope [in Chile], looking for changes in the light emitted from the white dwarf caused by its motion around the pulsar," said John Antoniadis, a PhD student at the Max Planck Institute for Radio Astronomy in Bonn, Germany An on-the-spot analysis showed that the pulsar was a heavyweight. It is twice the mass of the Sun, making it the most massive neutron star known. It is an excellent laboratory for fundamental physics.

Scientists expect that Einstein's theory of general relativity, which is already incompatible with quantum physics, would at some point no longer hold true in extreme conditions. "We thought this system might be extreme enough to show a breakdown in general relativity, but instead, Einstein's predictions held up quite well," said Paulo Freire of the Max Planck Institute. Thus- Einstein's theory of general relativity has stood up to its most intense test yet.

Rubble Rings. NASA's Cassini spacecraft has provided the first direct images of small meteoroids breaking into streams of rubble and crashing into Saturn's rings. These meteoroids range in size from about one-half inch to several yards. Saturn's rings are unusually bright and clean, suggesting that they are much younger than Saturn. Scientist need to know more about the rate that outside material bombards the rings. This latest finding will help them better understand Saturn’s ring formation and age, as well as for other solar system ring systems.

MINUTES OF THE APRIL MEETING

APRIL 27, 2013 at the MVCO

The meeting came to order at exactly 8:00 PM with President Lou DiNardo presiding. Twenty-two members answered Roll Call; two arrived after Roll Call. There were three guests that included Virginia Bartos, with the Iliff's were youngsters Kadden and Natalie Ostheimer. A Call to Read the Minutes was made. Bob Danko moved to suspend the reading which was seconded by Greg Higgins. With no further discussion a unanimous voice vote adopted the motion and the Minutes stand as accepted.

TREASURER'S REPORT: The Report was read by Steve Bartos. The lone expense was the purchase of a new supply of MVAS merchandise. We will gain this back as items are sold. There had been no bill received to date, for the temporary roof patch installed in March.

General Fund	**3/1 thru 3/31 2013**	
OPENING BALANCE:	$	9,833.48
CLOSING BALANCE:	$	8,832.03
AVAILABLE FUNDS (NON-RESERVED):	$	4,667.91
ACCOUNT NET GAIN/LOSS FOR THIS PERIOD:	$	-1,001.45
INCOME:		
DUES	$	80.00
INTEREST		0.15
TOTAL INCOME	$	235.60
EXPENSES:		
CK# 22787 MVAS CLOTHING	$	1,.081.60
TOTAL EXPENSES	$	1,081.60
Reserved Funds		
KEY DEPOSITS (FOR MVCO KEYS)	$	250.00
FROM ORIGINAL OAD FUND (FOR LAND PURCHASE)		3,914.12
TOTAL RESERVED FUNDS	**$**	**4,164.12**

2013 DUES PAID BY: S. DiRocco, E. Eaken.

CORRESPONDENCE: No mail received at P.O. Box (B. Danko reported). No other correspondence noted.

COMMITTEE/OFFICER REPORTS: *LIBRARIAN:* No report available*. IMAGING COMMITTEE:* Lou DiNardo spoke for the committee. He recounted some of the new techniques in image processing using filters that he and the McCullough's learned about after attending the North East Imaging Group conference. *VISUAL COMMITTEE:* Phil Plante asked for Committee Reports (none submitted) and offered blank forms (none taken). Also, no Homework was collected. It was noted that Homework would be collected at this point in the meetings. Phil held up examples of completed Homework and Visual Committee Reports to serve as examples and encouraged members to try.

OBSERVATORY DIRECTOR'S REPORT: Larry Plante reported that the roof had been raised a few weeks ago. But there was still water sitting in a new location. It was planned to raise the roof again under those spots. Larry passed the discussion over to Greg Higgins. Greg arranged and was on hand when the new roof membrane was installed in 2006. Greg noted that the original roofing material from the 1986 repair had a layer of insulation under it with the consistency of sawdust (technical name escaped memory). In any case, this insulation had become water-logged and disintegrated. This caused low spots- even with the 2006 membrane installed. Raising the roof further would just create new low spots and such activity would be futile. The solution would be a complete tear-off of the roof and insulation and install new roofing (with a pitch?).

A complete tear-off was decided against during the 2006 repairs due to expense. The 2006 membrane installation cost $3,500. Again, a tear-off would likely be too expensive to do now. The next best solution would be to install a pitched roof on top of the current membrane. Preferably a corrugated metal roof. Roof pitch was discussed. Bob McCully noted that about a 1/16" per foot pitch would drain rain water but wasn't sure if it would be enough for melting snow. For now, pricing on the materials needed for a metal roof will be investigated.

The slit on the 16" dome doesn't open or close without great difficulty or jamming. The replacement cable that was installed doesn't seem to work at all. It is planned to return to using chain as in the original system. The 1960's builders knew something we didn't? Please don't open the slits for the time being. Also, avoid parking north of the 8" building since the ground is always wet and soggy. You could get stuck. The well pump has been turned on as well as the refrigerators. All else is in fairly good shape. The MVCO is open for spring time observing.

OLD BUSINESS: Phil reminded the membership of the upcoming OTAA-Scenic Vista Stargaze. It's a regular public night but the OTAA clubs are invited to observe with us all night. Lou passed along some information about the park as given to him by Jodi McCullough. The Park has a new care-taker named Francis Miller. He should be contacted if you plan to go there to observe. His number is 330-271-1800. Please call earlier in the day and not late at night. The locks have not been changed since last year and the security lighting breaker box dose not have a lock on it. So we should have access to the light switches. There is a new park superintendent named Marie Cox. Call the Park Office at 330-424-9078, 8:00 AM to 12 noon, Monday-Friday, if you need to call. Phil reported that the new Park Program Director is Janice Palmer. Contact with her is usually not needed by our members.

All are reminded that the May 25th meeting at the MVCO is a business meeting but no host is scheduled. We will have a Memorial Day weekend BBQ. Bring your own BBQ meats to grill. Sides, desserts and drinks too. Sharing is always welcome. Phil Plante is slated to give a talk on variable stars and how to observe them, after the meeting.

NEW BUSINESS: Steve Bartos found out that Holloway Insurance would be doubling our premium from $250 to $500 per year. The Western Reserve Group handles our Holloway account but they found a new policy with the same coverage but with only a $50 dollar increase in cost. Our insurance would go up to $300 per year. Discussion on picking up this new policy followed. Greg Higgins moved to switch to the new policy. Bob Danko seconded the motion. By voice vote all were in favor of the move. Steve will continue with the transaction and make a payment. Steve also had a map of a two acre plot of land on a mountain top near Flying-W Ranch. It was investigated out of curiosity, but the two acres were priced at $20,000 the price negotiable. It is in really dark sky country- but a 2 hour drive away. No further action was called. Karin DiNardo had a brand new Bunn Coffee maker for the MVCO. New it cost $79.26. Bob Danko moved to reimburse her. With a second from Don Cherry, the members voted to make the reimbursement.

GOOD OF THE SOCIETY: Bob Danko has been working a lot of overtime and his wife has been very ill lately. Thus he has had no time to fulfill Observatory Director duties. With that he wished to give up this position. The president asked if anyone would be interested in the spot. Assistant to the Observatory Director, Larry Plante was willing to step in. President DiNardo appointed Larry back to his old job. Likewise, Dave Ruck was willing to return as Assistant O.D. Chuck Oisen was willing to help out as well and will be a member of the Observatory Staff.

Phil noted that Chris Stephan will be back in Ohio, living in Geauga OH. He plans to attend the May meeting. He looks forward to using the 8" refractor. It should be noted that Rose Marko had surgery on her shoulder after she broke it. Dennis sent word to Phil that he needs to attend to her while she mends and hoped they could both attend a meeting in a few months. A get well card was sent. Best of luck to you Rose.

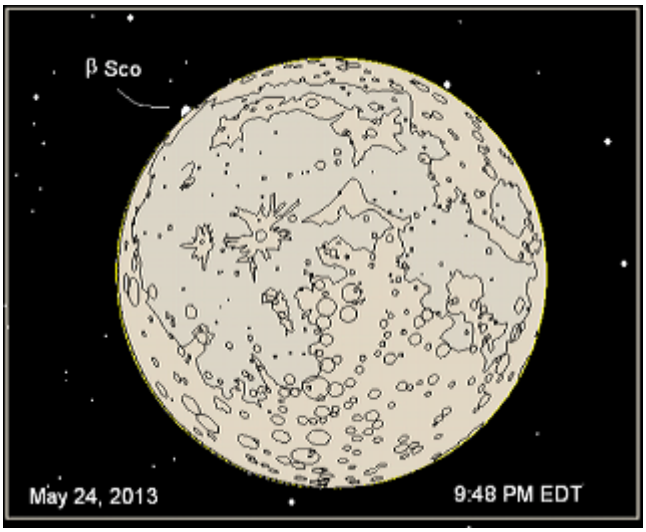
VISUAL REPORTS: Bob Danko told of his observations of Comet PanSTARRS while it passed through Cassiopeia. Phil Plante made 10 variable star estimates in April and saw M-42 through a 12.5" Newtonian while in California while visiting friends Isaac and Heidi. The scope was named Frieda and was most excellent.

ADJOURNMENT: Adjournment came at 8:43 PM. We thank our hosts Dave Ruck for the Pizza and Pandian for the Indian spiced chicken. Thanks to Rosemary Chomos for the pies and pastries. Phil brought the drinks, as did Pandian. The next business meeting will be at the MVCO on May 25, 2013. It begins at 8:00 PM. No hosts: it is a BBQ night. Bring your stuff! An after dinner variable star talk is scheduled.
PASSWORD: Name a moon of Saturn. *-minutes by Phil Plante*

MVAS REMINDERS

May 11: Scenic Vista Stargaze. If you get this in time, this is a reminder to bring your scope to Scenic Vista. We have a public observing night as well as OTAA observers on hand. We hope some of them show up! Bring your snacks and drinks. Dress according to weather forecast temps. You knew that didn't you?

May 24 Lunar Occultation: On the evening of May 24, 2013 (Friday), a Full Moon will occult the magnitude 2.6 double star β Scorpii. The moon will be about 12° high in the southeast as seen from the MVCO. This will be about the same for anywhere in the region. Start watching about 10 minutes early to spot β Sco. A small telescope should suffice. The moon's brightness may wash-out the star in binoculars. With a scope at medium power, try to keep as much of the Moon out of the field of view as possible, to lessen the glare. See if you can spot each component of the double star blink-out separately. This would make for a cool video! See the chart below to get an idea of what to expect. For those that know Universal Time, the actual occultation time is on May 25, 2013 at 1hr 48min UTC. The star re-appears at 2hr 16 min UTC, near where that small star sits on the upper right limb on the chart. That small star will be left far behind as the Moon moves leftward, in reference to the starry background. Hey, it's a Full Moon. We should have crystal clear skies. Right? Good luck. Let's hear some reports!



MAY 25: BBQ. It can't be stressed enough that we need to eat at meetings. The smell of BBQ drives the hungry astronomer. But don't get BBQ on the eyepieces! And to be sure, forget the weight loss diet- as they say "resistance is futile". All kidding aside, we look forward to a pleasant outing this meeting night. Please feel free to bring what ever you want to cook or a dish to share. Please do eat enough so that you will sleep through the variable star talk. Takes the pressure off of Stargeezer.

WE HAVE MVAS CLOTHES: With a new supply on hand we have new sweat shirts (no hood) $16 each and new stretch ball caps for $16 ea. New MVAS logo patches are $6.00 each. Regular stuff has the same prices: T's for $10. Hoodies for $25, Polo shirts $25, etc. Go grab'em!

MVAS ACTIVITIES

Chili-fest 2013: We had a great turn-out with about 16 folks attending. The weekend cooled down just right for several bowls of chili. With seven very different pots going, there was plenty for all. Everyone seemed to enjoy Don Durbin's batch with Italian sausage in it. Phil had some spicey hot green chili beef stew. Larry's was more medium to balance the palate. Don Cherry had the habanera brew toned down to excellence. Virginia's chicken chili was to crow(?) about. Rich's was super atomic hot (hahaha). Pandian had the only empty pot at the end. Guess that says it all. Larry won the Herschel Atlas.

MVAS Homework: M-4

Since dark sky observing usually begins around 10:00 PM in early May and into June, you could start your sessions in Virgo looking for that quasar 3C 273. Virgo will be near the meridian during the 11:00 PM hour, mid-May. Scorpius reaches the meridian around 2:00 AM. You could start your June Homework on Scorpius and M-4 in May if you can stay up late. M-4 was discovered by Philippe Loys de Chéseaux in 1746. Charles Messier cataloged it on May 8, 1764. It is one of the nearest globular clusters in the sky. Estimated distance is about 7,200 light years. It is situated prominently about 1.3° west of Antares. Being as bright as mag 5.6, it can be detected by the naked eye under very dark skies, and is prominent in binoculars. M4 would be one of the most superb globulars, but it's obscured by thick clouds of interstellar matter. Its angular diameter on deep images is about 36 arc-minutes; more than the Full Moon! This corresponds to a linear diameter of about 75 light years. Visually, it is around 14 arc-minutes in diameter. This globular gravitationally dominates a spherical volume 140 light-years in diameter. M-4 contains many white dwarfs, which are the small dense burned-out cores of stars that were once like our Sun.

Observer's Notes

A Quasar Quest!

Seen through a backyard telescope of 8 inches or more in aperture, 3C 273 just looks like a faint star. But that tiny, dim point of light is the most-distant object visible through an amateur telescope. It is estimated to be about 2.5 Billion light-years distant. The fact that it is visible at all tells us that 3C 273 is far from being tiny or dim. Indeed, it is one of the most powerful objects in the universe: a quasar. Quasar 3C 273 was cataloged in the 1950s as a strong source of radio waves (hence its name: object 273 in the third Cambridge catalog of radio sources). Later, astronomers also discovered a star-like point of light at the same position in the sky. It and several similar objects were described as quasi-stellar objects, which was later shortened to quasar.

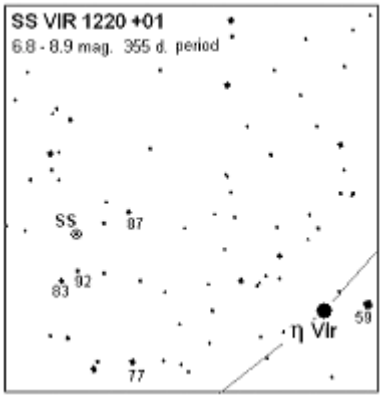
The redshift in the spectrum of 3C 273 is so strong that it indicates the object is moving away from us at 16% of the speed of light -- about 30,000 miles per second. Such a high-speed motion also means that the object is far away, and is moving because of the expansion of the universe itself. With a redshift of 16% of light speed, this places the object at about 2.5 billion light-years away. To be visible from that distance, it must be trillions of times brighter than the Sun! In fact, if it were just 10 parsecs from Earth (33 light-years), 3C 273 would shine as brightly in Earth's sky as the Sun does.

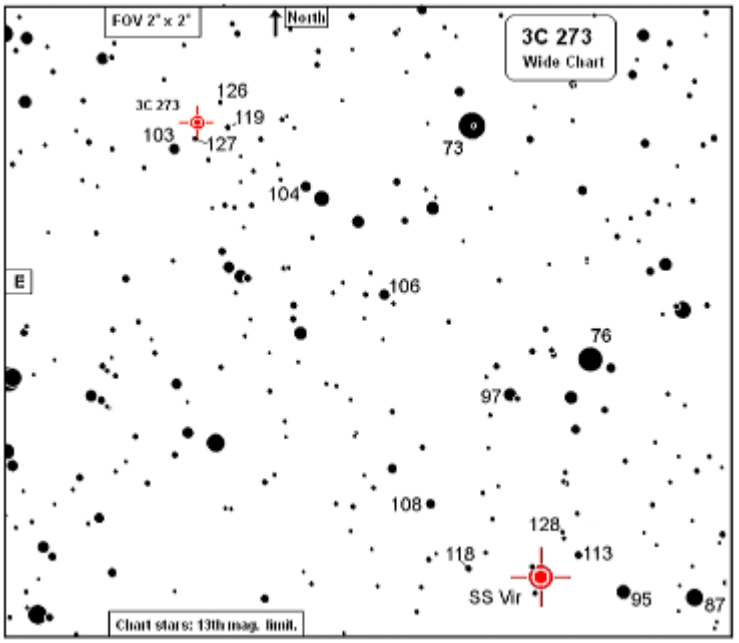
It turns out that 3C 273 changes brightness over a period of just a few days or weeks. But the distance that light can travel during those time frames sets the upper limit on the object's physical size. We can see effects only how far out light has traveled from the source. This tells astronomers that the object must be quite small -- around the size of our own solar system. How to cram the energy of an entire galaxy, into a space that is only a few light-days across, seemed impossible. Subsequently we've learned that quasars like 3C 273 consists of a supermassive black hole at the center of an elliptical galaxy. The black hole swallows about one solar mass of material every year. Material gathers in the accretion disc around the black hole which is then slowly swallowed-up. This generates enormous energy (friction-heat) as the material speeds up and jams together just before it spirals into the black hole's event horizon. 3C 273 also produces a strong jet of charged particles that shoot more than 100,000 light-years away from the black hole. The jet produces energy across the entire spectrum, from radio waves to visible light to X-rays.

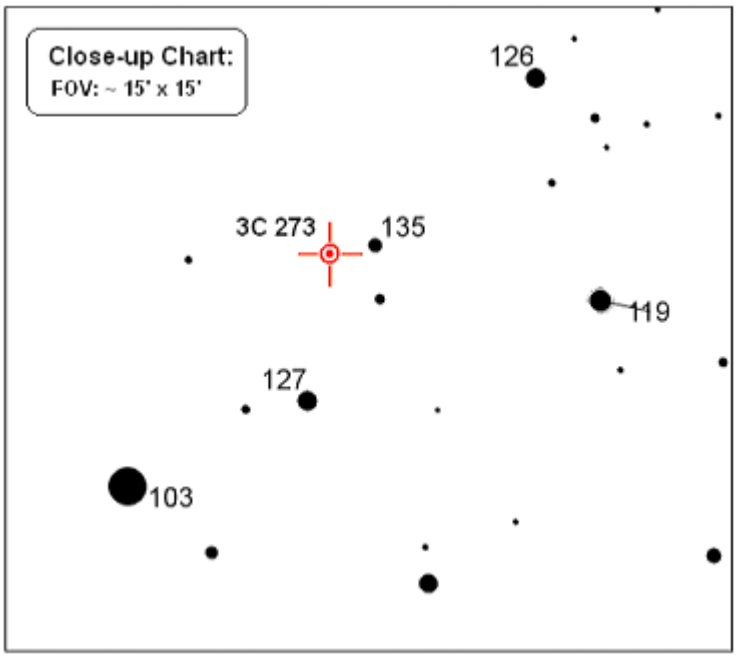
3C 273 is a point source that hovers around magnitude 12.7 in the constellation Virgo. AAVSO observers have enthusiastically followed 3C 273 over the last 40 years. The long-term light curve of 3C 273 has helped quasar theorists understand the behavior of these objects. The AAVSO urgently wants visual observers to keep up the good work! The light curve of any quasar becomes more valuable the longer the observation span becomes. But, even if you don't contribute to the AAVSO data base, this is a remarkable object to catch a glimpse of. I've glimpsed it in a C-8 at Scenic Vista with a quarter Moon up. Several others confirmed the sighting.

Use the charts provided to find 3C 273. We will star hop to the quasar from the variable star SS Vir. First locate η Vir in the sky and get it in your finder. Scan to the east to find SS Vir. It usually has a pinkish to reddish tint. Get SS Vir in a wide field low power eyepiece. Next use the middle chart to hop northward from SS Vir. Find the 7.6 mag. star then move north to find the 7.3 mag. star. Scan east to the 10.4 star at the end of the curved line of stars. Three of those stars (including the 10.4 at the east end) "point" to a 10.3 mag. star. Once you identify the 10.3, use the bottom chart to ferret out the 11.9 mag star and then 3C 273. It should be close in brightness to the 12.6 and 12.7 mag. stars in the field. These are at the realistic limit of an 8 inch scope. Good luck!

- P. Plante

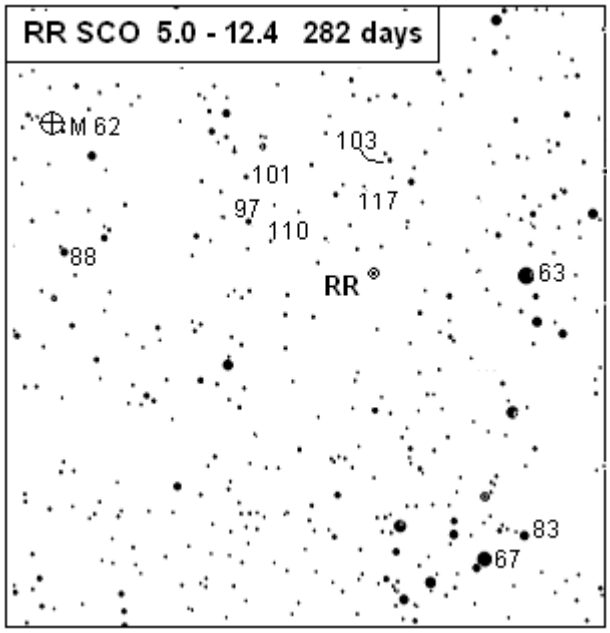




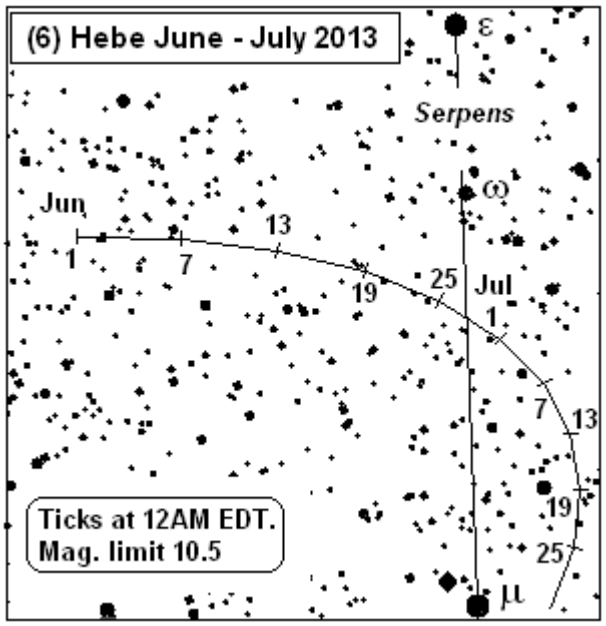


MVAS OBSERVER CHARTS

Variable star of the month: **RR Scorpii** (*abbrev:* RR Sco). This is another challenging variable. You'll need a scope to follow. Look for it SW of M-62. By New Moon on May 10th, it will be around 11th magnitude. It's fading to a minimum light of about 11.8 magnitude, on June 12th. It then spends the summer getting brighter. It's above 11th magnitude by August. It is predicted to be at maximum light November 3rd. But we lose Scorpius to the Sun (setting) by late September. If you can follow RR under these conditions you can follow any variable!



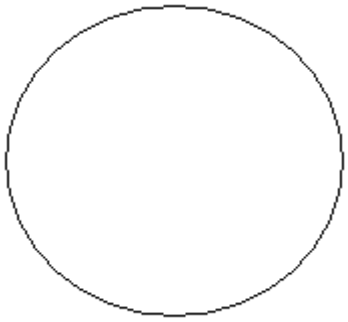
Asteroid of the month: (**6) Hebe.** Move NW of Scorpius on into Serpens. Here we'll find our asteroid (6) Hebe tracing a slow loop between E and mu Ser. It begins June at 9.6 magnitude but slowly fades away. It's down to 10.4 by the end of July. It is almost on the celestial equator around July 1st. Looks like you'll be using that scope once a gain this month!



MVAS OBSERVATIONS - DUE JUNE 2013

OBSERVER_____

Featured object: M-4. Please try a sketch. Draw in field stars first to give your reference points. Lightly trace out the perimitter of M-4. Use graphite to fill in the "glow". You are making a negative so bright areas should be correspondingly darker-more graphite. Put pinpoints in the glow for any clutster star you see. Remember, the circle below represents the eyepiece FOV.



Magx._____

M-4 Observation:

Date:_____ Time(EDT)_____ Scope_____

RR Sco magnitude estimates:

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

(6) Hebe Observations:

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

Other Objects in Scorpius to observe

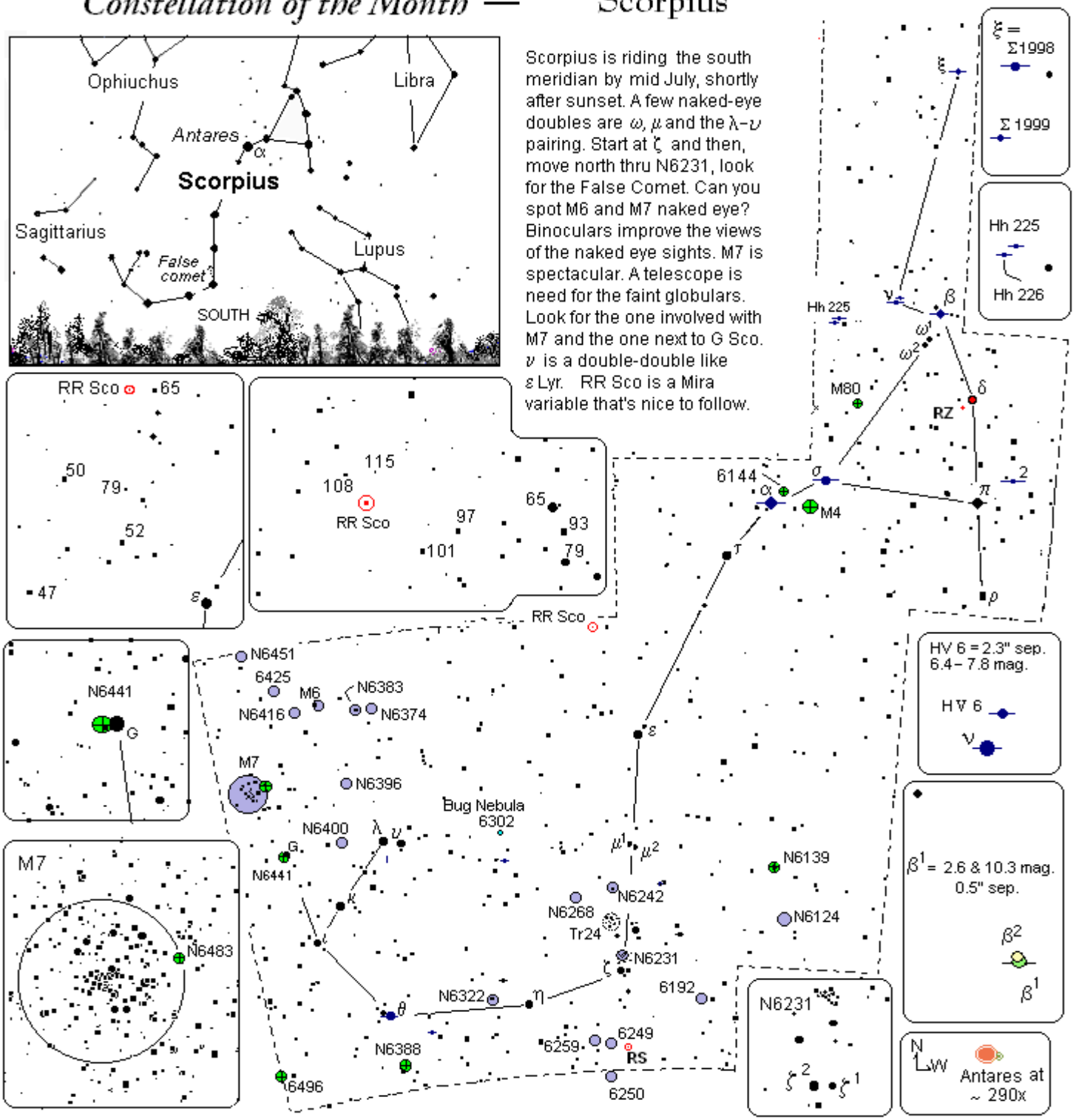
D. Sky	Date	Scope		**Dbl.**	Date	Scope	SEP	MAG	SPLIT?
M- 6	_____	_____	α	Sco	_____	____	2.9"	1.0 - 5.4	Y / N
M- 7	_____	_____	β	Sco	_____	____	13.6"	2.6 - 4.9	Y / N
M- 80	_____	_____	ξ	Sco	_____	____	7.5"	4.9 - 7.3	Y / N

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 — Scorpius

Scorpius is riding the south meridian by mid July, shortly after sunset. A few naked-eye doubles are ω, μ and the λ-υ pairing. Start at ζ and then, move north thru N6231, look for the False Comet. Can you spot M6 and M7 naked eye? Binoculars improve the views of the naked eye sights. M7 is spectacular. A telescope is need for the faint globulars. Look for the one involved with M7 and the one next to G Sco. υ is a double-double like ε Lyr. RR Sco is a Mira variable that's nice to follow.



DEEP SKY

M4	GC	5.4m	30'	
M6	OC	4.2	14'	80 stars
M7	OC	303	80'	80 stars
M80	GC	7.3	9'	
N6124	OC	5.8	29'	100 stars
N6383	OC	5.5	5'	40 stars
N6388	GC	6.5	6'	
N6416	OC	5.7	18'	40 stars
N6441	GC	7.2	10'	
N6483	GC	10.2	3.5'	

DOUBLE STARS

α Sco	1.0, 5.4	2.9"	red, greenish
β1,2	2.6, 4.9	13.6"	yell, greenish
ν Sco	4.4, 5.3	1.3"	41" s. of HV6
σ Sco	2.9, 8.4	20.0"	
2 Sco	4.7, 7.4	2.2"	
Σ1998	4.8, 7.3	7.6"	white, grey
Σ1999	7.4, 8.1	11.6"	blue, y.wht.
Hh 225	7.2, 8.8	47.1"	
Hh 226	7.6, 8.2	12.9"	

RR Sco 5.0 to 12.4 mag. 281 day per.

Check list

M4	____	α Sco	____
M6	____	β1,2	____
M7	____	ν Sco	____
M80	____	σ Sco	____
N6124	____	2 Sco	____
N6383	____	Σ1998	____
N6388	____	Σ1999	____
N6416	____	Hh 225	____
N6441	____	Hh 226	____
N6483	____	RR Sco was	____ mag. on ___/___/___
		RR Sco was	____ mag. on ___/___/___

Instruments used:

____ on ____

____ on ____

____ on ____

____ on ____

2013 JUNE SKY ALMANAC

Solar and Lunar (EDT).

Date	Sunset	Moonrise	Moonset
1	8 : 50	01 : 52a	— : —
5	8 : 53	03 : 57a	— : —
9	8 : 56	06 : 47a	— : —
13	8 : 58	— : —	11 : 31p
17	8 : 59	— : —	01 : 29a
21	9 : 00	— : —	04 : 06a
25	9 : 01	10 : 43p	— : —
29	9 : 01	12 : 25a	— : —

PLANET WATCH

	Venus	Saturn	Neptune
	Sets	*Sets*	*Rises*
	10:13p	4:26a	1:47a
	10:19p	4:09a	1:31a
	10:24p	3:53a	1:16a
	10:28p	3:37a	1:00a
	10:32p	3:21a	12:44a
	10:34p	3:05a	12:28a
	10:35p	2:48a	12:13a
	10:35p	2:32a	11:53p

June 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 ☾						

Asteroid for June 2013 (6) Hebe

Date	Transits	RA hr. min	Dec. deg.	Alt.	Azm	Magnitude
		topocentric				
1	12 : 57 am	16 : 12.1	+01.6	48º	158º	9.6
7	12 : 28 am	16 : 06.5	+01.5	50	169	9.7
13	11 : 54 pm	16 : 01.3	+01.4	50	181	9.7
19	11 : 26 pm	15 : 56.5	+01.1	49	191	9.8
25	10 : 58 pm	15 : 52.5	+00.7	47	201	9.9
30	10 : 33 pm	15 : 49.2	+00.2	45	210	10.0
		(at midnight)		*(at midnight)*		

Variable Star of the Month: **RR Sco** 5.0- 12.4 281 days

Celestial Highlights

Date	UT hr	
2	00	SS Vir at max. 6.8mg.
4	21	Venus in M-45
8	16	**NEW MOON**
12	17	Mercury 24º E elongation
16	17	**FIRST QUARTER MOON**
20	17	Mercury 1.9º S. of Venus
23	11	**FULL MOON**
30	18	**LAST QUARTER MOON**

LUNAR OCCULTATIONS FOR: JUNE 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	3	36	49	*2*	07	36	49	R	34-	13º	097º	ZC 3525	7.6	281º	NA
3	4	23	31	*3*	08	23	31	D	24-	16	x94	ZC 105	4.4	041º	92"
3	5	55	04	*3*	09	55	04	R	24-	22	100	62 Psc	5.9	221º	NA
17	0	13	56	*17*	04	13	56	D	54+	13	252	ZC 1726	6.7	161º	NA
20	23	13	37	*21*	03	13	37	D	92+	30	182	41 lib	5.5	084º	0.30"
21	0	28	26	*21*	04	28	26	R	92+	27	202	41 lib	5.5	296º	0.30"
21	1	08	33	*21*	05	08	33	D	92+	23	211	KAPPA LIB	4.8	141º	168"
21	2	00	00	*21*	06	00	00	r	92+	17	222	KAPPA LIB	4.8	231º	NA"
24	3	22	19	*24*	07	22	19	R	99-	28	198	ZC 2763	6.5	240º	0.08"

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

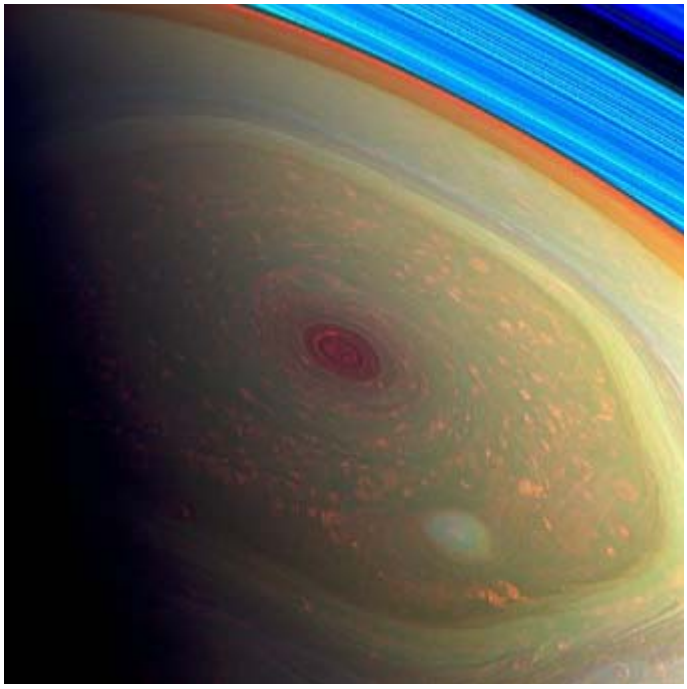
Occultations computed using Occult v3.6 (I.O.T.A.)

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

GALLERY…..

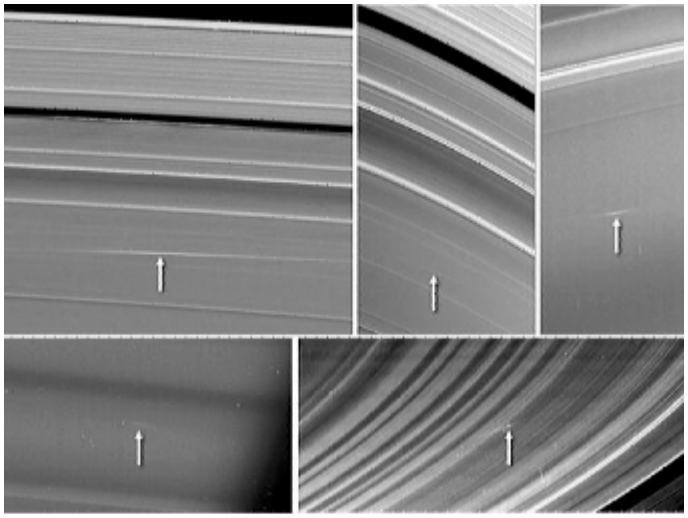
A View From Saturn:

Here are some recent images sent by the Cassini spacecraft. Text and images taken from the Cassini Mission website.

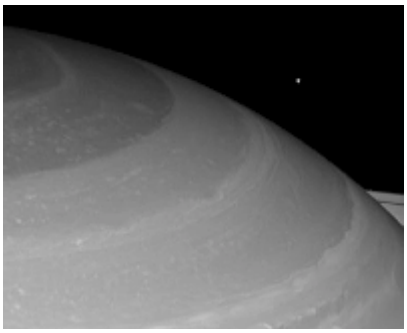


This false-color image from NASA's Cassini mission highlights the storms at **Saturn's north pole.** The angry eye of a hurricane-like storm appears dark red while the fast-moving hexagonal jet stream framing it is a yellowish green. Low-lying clouds circling inside the hexagonal feature appear as muted orange color. A second, smaller vortex pops out in teal at the lower right of the image. The rings of Saturn appear in vivid blue at the top right. The images at 890 nanometers are blue. Images at 728 nanometers are green, and images at 752 nanometers are red. This color scheme correlates to different altitudes in the planet's polar atmosphere: red indicates deep, while green shows clouds that are higher in altitude. High clouds are typically associated with locations of intense upwelling in a storm. These images help scientists learn the distribution and frequencies of such storms. The rings are bright blue in this color scheme because there is no methane gas between the ring particles and the camera. Image released: April 29, 2013

Enceladus: 313 mi. across, is seen here illuminated by light reflected off Saturn. We see the Saturn-facing side of the moon. Enceladus' north is up and rotated 45 degrees to the right. The image was taken in visible light with the Cassini spacecraft narrow-angle camera on Jan. 18, 2013. Image scale is 3 miles per pixel.



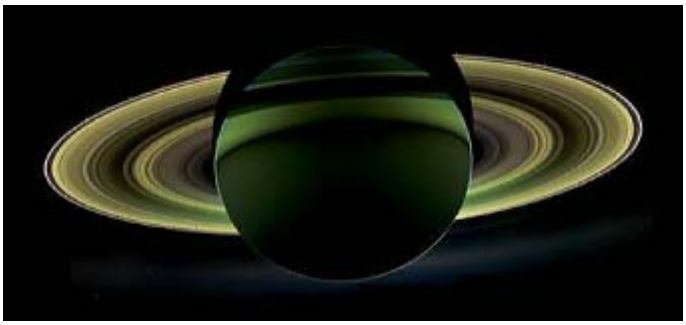
Meteors at Saturn: Five images of Saturn's rings, taken by NASA's Cassini spacecraft between 2009 and 2012, show clouds of material ejected from impacts of small objects into the rings. The clouds of ejected material were visible because of the angle sunlight was hitting the Saturn system and the position of the spacecraft. The first four images were taken near the time of Saturn equinox, when sunlight strikes the rings at very shallow angles, nearly directly edge-on. During Saturn equinox, which occurs only every 14.5 Earth years, the ejecta clouds were caught in sunlight because they were elevated out of the ring plane. The last image was taken in 2012 at a very high-phase angle, which is the sun-Saturn-spacecraft angle. This geometry enabled Cassini to see the clouds of dust-sized particles in the same way that dust on a surface is easier to see when the viewer is looking toward a light source.



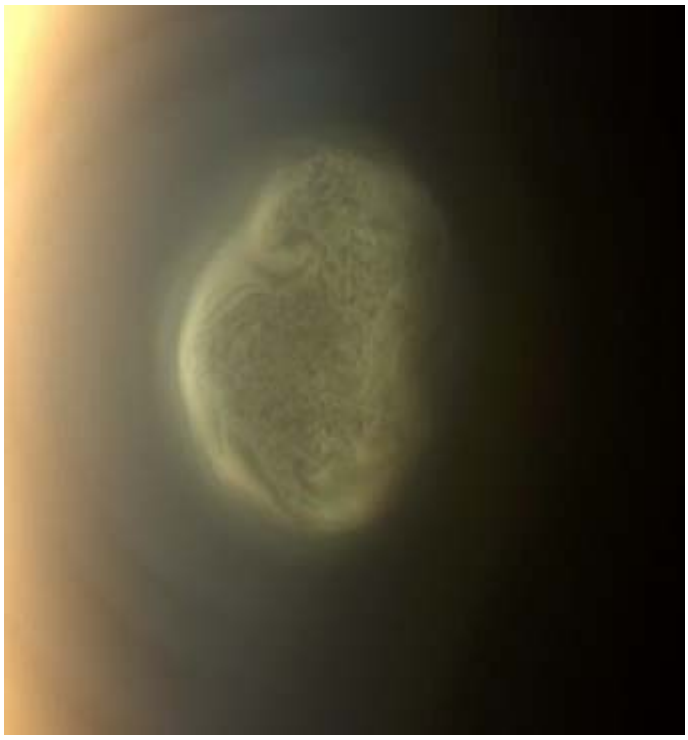
Saturn and its north polar hexagon dwarf Mimas as the moon peeks over the planet's limb. Saturn's A ring also makes an appearance on the far right. Mimas is 246 miles across.
Taken Nov. 28, 2012

Saturn's moon Rhea at crescent phase, a view never visible from Earth. Near the terminator, a few of Rhea's many craters show up in sharp relief. With a diameter of 949 miles (1,528 kilometers) Rhea is Saturn's second-largest moon.

Dawn on Saturn is greeted across the vastness of interplanetary space by the morning star, Venus, in this image from NASA's Cassini spacecraft. Venus appears just off the edge of the planet, in the upper part of the image, directly above the white streak of Saturn's G ring. Lower down, Saturn's E ring makes an appearance, looking blue thanks to the scattering properties of the dust that comprises the ring. A bright spot near the E ring is a distant star. Jan 4, 2013



Taken while the spacecraft was in Saturn's shadow, the cameras were turned toward Saturn and the sun so that the planet and rings are backlit. In addition to the visual splendor, this special, very-high-phase viewing geometry lets scientists study ring and atmosphere phenomena not easily seen at a lower phase. Since images like this can only be taken while the sun is behind the planet, this beautiful view is all the more precious for its rarity. The last time Cassini captured a view like this was in Sept. 2006, when it captured a mosaic processed to look like natural color, entitled "In Saturn's Shadow" In that mosaic, planet Earth put in a special appearance, making "In Saturn's Shadow" one of the most popular Cassini images to date. Earth does not appear in this mosaic as it is hidden behind the planet. Images taken Oct. 17, 2012



This true color image captured by NASA'S Cassini spacecraft before a distant flyby of Saturn's moon Titan on June 27, 2012, shows a south polar vortex, or a swirling mass of gas around the pole in the atmosphere of the moon. The south pole of Titan (3,200 miles, or 5,150 kilometers, across) is near the center of the view. The seasons have been changing since Saturn's August 2009 equinox signaled the beginning of spring in the northern hemisphere and fall in the southern hemisphere for the planet and its many moons. Now the high southern latitudes are moving into darkness. The formation of the vortex at Titan's south pole may be related to the coming southern winter and the start of what will be a south polar hood.

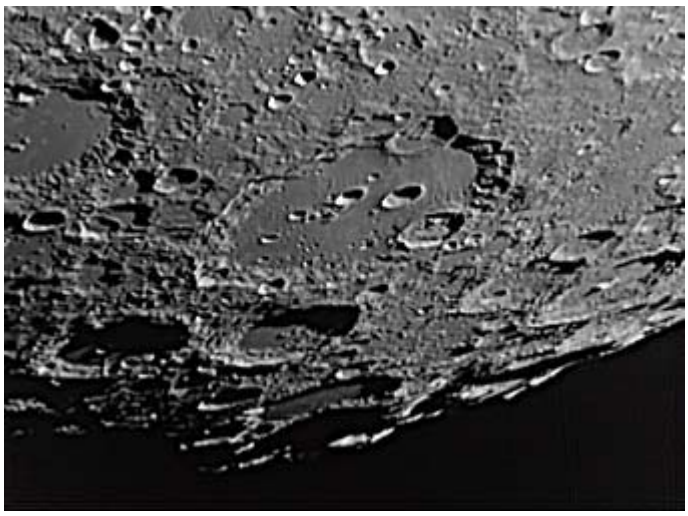
MVAS imager Mike Heim captured this image of Saturn on April 26, 2013. He noted that the seeing was poor and that the rings have brightened considerably. With just a little enhancement, the C ring is very visible. This is a stack of 4000 out of a total of 5000 frames stacked in Registax 6, camera is a Microsoft Lifecam Cinema HD using the 8 inch Newtonian with stacked 2X and 3X barlows. Effective focal length = 6000 mm.

Chili-fest 2013

Some photos of the event. Standard stuff. It was a fun way to open the MVCO for the warm observing season. Ironically, the warm weather during the week had cooled in time for the weekend. Perfect chili weather-- with clear skies.

The spread….come and get it!

And indeed they did. The serious chore of mass consumtion of chili. There were some good sides; veggies and Don's corn bread. Several fruit pies brought by Rosemary, was dessert.



Clear skies at sunset showed promise for observing. Cars seemed to be safe from soggy ground. The MVCO seemed to have drained well from recent showers. It was a pleasant evening even though the clouds rolled in later.

Mike set up his 8" to try some imaging of the Moon. At least until those clouds came by.

At left is an image of the crater Clavius taken by Mike during the Chilli-fest. Before the clouds moved in. They seemed to do this after we all had chili. A connection? Make your own joke….

Editor's note: Every time I see Clavius I can't help but think of the film *2001: A Space Odyssey.* According to the movie, Clavius was home to a lunar base. When the Tycho Monolith was discovered, outside contact with Clavius was shut down. All anyone could get was a message "phone lines are temporarily out of order". A cover story was in place that an epidemic had broken out at the Base. Character Dr. Heywood Floyd made a short stop at Clavius on his way to investigate the Tycho Monolith. A year later a spacecraft left for Jupiter. The HAL 9000 computer malfunctioned along the way. It was man vs. machine. A necessary test or step for the human race in reaching the next level (the Star Child). Funny, since the real year of 2001, we've had spacecraft at Jupiter and the computers worked fine. We even had a Monolith at the MVCO. - *P.Plante*