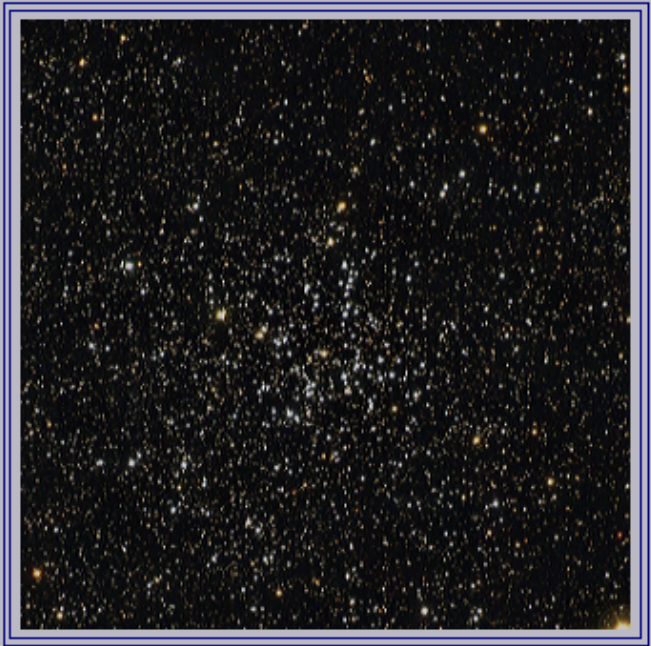


THE METEORITE



M-38
NGC-1912
Open cluster in
Auriga



Newsletter of the Mahoning Valley Astronomical Society, Inc.

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NOVEMBER 2010

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Meteorite Editor: Phil Plante
1982 Mathews Rd. #2
Youngstown OH 44514



NOVEMBER 2010

NEWS NOTES

Taking a Pulse. Launched in March 2009, the Kepler Spacecraft was designed to discover Earth-size planets orbiting other stars. Using a special CCD photometer, it constantly monitors the brightness of 150,000 stars in its field of view. Other data gleaned from the observations have detected stellar oscillations or "starquakes". Analogous to using earthquakes to understand the interior structure of Earth, starquakes can reveal much more detail about stellar interiors; how they are constructed, age and evolve. Scientists representing the Kepler Asteroseismic Science Consortium (KASC) presented their result at a news conference at Aarhus University in Denmark on Oct. 27, 2010. It was noted that Kepler is providing data of such good quality that it will change our understanding of how stars work, in greater detail.

One oscillating star in the field was highlighted: called KIC 11026764, it has the most accurately known properties of any star in the Kepler field. Very few stars in the universe are known to a similar accuracy. It has an age of 5.94 billion years and has grown to a little over twice the diameter of the Sun. It will continue to swell in size as it transforms into a red giant. The oscillations reveal that this star is powered by hydrogen fusion in a thin shell around a helium-rich core. Variable star RR Lyrae has been observed for over 100 years. It has a period of 13.5 hours. During its period, other smaller amplitude changes occur. Astronomers have been puzzled as to the cause of these smaller oscillations. Kepler may provide clues in solving the puzzle. Kepler discovered a previously unknown period about twice as long as the 13.5 hr. period. It seems to be linked to the smaller changes. By watching the pulsations of stars, Kepler data will give us a better understanding of the future of our Sun and the evolution of our galaxy.

Wet Wobbles. Saturn's moon Enceladus should have frozen solid billions of years ago. It's too far from the sun for solar heating and too small (500 miles in diameter) to retain heat. In 2005, NASA's Cassini spacecraft discovered a giant plume of water gushing from surface cracks over the moon's south pole. This indicates that there is a reservoir of water beneath the icy surface. Cassini also revealed that the water is salty. This points to a large reservoir, perhaps even a global subsurface ocean. But to have liquid water, you need heat. Estimates from the Cassini data show that the south polar heating is equivalent to a continuous release of about 13 billion watts of energy.

To explain this mysterious warmth, some scientists invoke radiation heating combined with tidal heating. But Enceladus probably couldn't accumulate enough radioactive elements during formation to be heated this way. Tidal friction seems to be the best bet- as gravitational forces stretch the moon as it moves around in its oval shaped orbit. A new theory suggests that Enceladus wobbles- much like lunar wobbles, or librations. Computer maps of tidal stress zones compared to maps of observed warmest zones match up well when wobble is assumed in the model. Being based on gravity, this would indicate that the water oceans are long-lived. Such a stable environment is needed for life to form. This makes Enceladus a promising candidate in the search for extraterrestrial life forms in the solar system; not just Mars and Jupiter's moon Europa.

Newsletter of the Mahoning Valley Astronomical Society, Inc.

MVAS CALENDAR

- DEC 4** New Moon weekend. Observing at MVCO? 7 PM?
- DEC 11** Christmas Dinner at Boardman Park. 6:00 PM.
- DEC 11** MVAS Annual Business meeting. Officer Elections. Christmas Raffle is held.
- DEC 21** Total Lunar Eclipse. Partial phase begins 2:32 AM Home viewing advised; MVCO for die hards.

NATIONAL EVENTS IN 2011

- APR 16 - 17** NEAF 2011 will be held in Suffern, NY at the Rockland Community College. It's the 20th Anniversary of NEAF.
<http://www.rocklandastronomy.com/NEAF/index.html>
- MAY 25 - 30** 2011 RTMC Astronomy Expo (Riverside) To be held at YMCA Camp Oakes, five mi. southeast of Big Bear City, CA.
<http://www.rtmastronomyexpo.org/>
- MAY 29 - JUN 4** Texas Star Party near Fort Davis, TX. On-line registration begins in late November.
<http://www.texasstarparty.org/>
- JUL 28-31** 2011 Stellafane Convention in Springfield VT.
<http://stellafane.org/>

OTAA MEETINGS 2011

- MAY 7** MVAS- OTAA Scenic Vista Stargaze
- AUG 27** MVAS-OTAA at the MVCO

MVAS BOARD OF TRUSTEES

President	Sam DiRocco
Vice President	Harry Harker
Treasurer	Steve Bartos
Secretary	Phil Plante
Trustee (Appointed)	Bill Pearce
Trustee (Appointed)	Roy McCullough
Trustee (Elected-membership)	Dan Schneider

OBSERVATORY STAFF

Observatory Director	Larry Plante
Librarian	Rosemary Chomos

PUBLICATIONS STAFF

Meteorite Editor	Phil Plante
Assistant Editor	Steve Bartos
MVAS Webmaster	Harry Harker

MVAS REPRESENTATIVES

OTAA Representative	Harry Harker
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MVAS, P.O. BOX 564 NEWTON FALLS, OH 44444-9998
 MVAS Homepage- <http://mvobservatory.com>

MINUTES OF THE OCTOBER MEETING

OCTOBER 23, 2010 at the MVCO

President DiRocco was unable to attend due to a death in the family. Our condolences are sent. Vice President Harry Harker presided; calling the meeting to order at 8:00 PM. Roll Call was answered by 18 members. Two guests were present: Karen and Dominic Mattuissii. Phil noted that Mike Daugherty was now in college in Tucson, AZ. A Call for the Reading of Minutes was made. Roy McCullough moved to suspend the reading. A second to the motion was made by Larry Plante. By voice vote the minutes were accepted as published.

TREASURER'S REPORT: The Report was submitted earlier by Steve Bartos- who was unable to attend (wedding). The report was read by the Secretary. On a motion by Greg Higgins and a second from Dan Schneider, a unanimous voice vote accepted the Report as read.

General Fund 9/1 thru 9/30 2010

OPENING BALANCE:	\$ 7,192.01
CLOSING BALANCE:	\$ 6,933.28
AVAILABLE FUNDS:	\$ 6,683.28

INCOME:

RAFFLE TICKETS (CHRISTMAS)	\$ 50.00
ASTRONOMY CALENDAR	10.00
INTEREST	<u>0.62</u>
TOTAL INCOME	\$ 60.62

EXPENSES:

CK# 2737 10" BUILDING MATERIALS	\$ 319.35
TOTAL EXPENSES	\$ 319.35

Reserved Funds

KEY DEPOSITS	\$ 250.00
--------------	-----------

CORRESPONDENCE: The usual NASA/JPL material was received. Phil noted that the Night Sky Network sent out an email that the MVAS was to get a (small) lunar meteorite as a reward for our activities. Harry was curious as well as to why we haven't got it yet. No other correspondence was received.

COMMITTEE/OFFICER REPORTS: No active committees.

OBSERVATORY DIRECTOR'S REPORT: Larry Plante reports that he has wired the ground rod to the breaker box at the 12" building. Something that was left undone since the building was constructed. He has also wired a separate switch for the back porch light. Now the front lights can be off while someone uses the back porch light for grilling, etc. during observing sessions or OTAA meetings. Before, all outside lights were either on or off at the same time. He made a temporary repair to the tool shed skylight. The "kids" had broken it again. They have been seen playing on the shed roof during the OTAA and scolded. But apparently this didn't seem to have any effect. Larry has obtained a 1/4" thick piece of Plexiglas which will be installed. He hopes this will be harder to break.

There was a brief discussion on closing out the MVCO for winter. The well will be shut down after the Halloween party. The refrigerators will be emptied and shut down after the November 6th observing session at the MVCO. There were no "official" events scheduled that weekend- but it is a new moon weekend. Thus it has been posted as a last chance for observing at the MVCO this year. If weather cooperates, all are welcome to stop by the MVCO for an impromptu star party. Check the emails.

OLD BUSINESS: Phil reminded everyone to get those raffle tickets moving. He has more if you need them. Don't be shy to ask. Regarding the 50" mirror, there has been no change in status. It still guards our front door. The buyer has until the end of November to pick it up and pay the balance. Jodi McCullough has renewed her subscription to *Astronomy Technologies Magazine*. A member can start a subscription at a discount by signing up on their website. To get the discount, type in the discount code as "MVAS" in the appropriate code box on the subscription form. Our price is \$14 per year.

NEW BUSINESS: Harry reminded the membership that we have elections this year. A slate of candidates will be announced at the November meeting. The voting will be done at the December meeting. As such a Nominating Committee was needed. Rosemary Chomas has volunteered to serve in this capacity. She was given a roster and will call as many of you as possible to see if you are interested. You may of course tell her before-hand what your intentions are, to make this job easier. All four officer positions are open: President, Vice President, Treasurer, and Secretary (these are 2 year terms). We will also need two candidates for Trustee positions (2 and 1 year terms, depending on the Trustee designation).

There was a brief discussion on the dinner fee for the Christmas Party. It was \$10 per person last year. On a motion by Phil Plante and a second by Roy McCullough all were in favor of the fee. The hall has been rented and paid for and Tony Mehle has offered to cover the food costs again (thanks Tony!). This fee will help offset any short fall from ticket sales and serve as additional revenue for the general fund. Dave Ruck asked about Astronomy calendars. It was not known how many were left. Several members were not aware that we have had these since the OTAA meeting. It was believed we could still order more if needed, if there were no more left in the current supply. Harry would contact Steve on this. There was also a request for some MVAS apparel (hoodie?). It was thought that our inventory was getting low too. This will be checked and it was suggested members contact Steve to see what he had on hand. We may need to replenish our merchandise stock.

GOOD OF THE SOCIETY: Rosemary suggested that Mike be told that he needs to keep an eye on the shed as it presents a dangerous situation if one of his kids falls through. Not to mention water damage to our equipment and supplies. Rosemary also suggested we should build a wooden shed. Phil Plante noted that Mike Sprague still had the 8ft. ladder that is used for Titan- as of this meeting. Rosemary re-iterated that all beer left in the refrigerators will be dumped when she cleans out the refrigerators. She can't bring these to the Christmas Party- as there is no alcohol permitted on-site.

Jodi relayed information about the fall Star Count Program. Participants were asked to look at Cygnus and determine the faintest stars they could see from their location. Instruction, purpose, and charts were available on the website of Starcount.org. The observing window ran from Oct. 20 till Nov. 12. Larry Plante noted that Greg Klocek and his wife planned to attend the Halloween Party. They wanted to bring some custard from Rita's. Their season ended that day as they would be closing for the winter. We would were to finish-off the left over supply. Phil noted that the *Mystery In The Sky* DVD had reached its funding goal and is now in production. He has three DVD's ordered; one will be for the Terry Biltz Library at the MVCO. He should get these sometime in November.

Someone asked if they had heard what happened with the

auto accident on Rt. 534 during the September meeting. When it was time to leave that night, the road was still blocked and earlier we all heard the life-flight helicopter leaving the area. Rosemary said she only saw a report of a single car accident hitting a telephone pole. She could not find any deaths reported, however. This was at least good news in no fatalities.

VISUAL REPORTS: Dick Klesch reported he saw a bright meteor and trail pass near the Moon in the sky. A rare but beautiful alignment. Eric Klechsh observed the Great Red Spot in exquisite detail, using their 6" reflector at 100x. Lou DiNardo also imaged Jupiter and one night in early October, he could see the size difference between Ganymede and Europa. Ganymede was easily seen as twice the size and it had a deeper orange color than Europa. Lou used a 6" Schmidt-Newtonian. Greg Higgins reported that several members had three good nights at the MVCO in early October. He put comet Hartley-2 in all the MVCO scopes (25", 8", 12") in use. Roy McCullough also spotted it in binoculars. For variables: Chris Stephan had 313 so far in October while Phil got 43. Phil also did a few sketches of Jupiter and Uranus (using the 25") for ALPO. Jodi had a power point of her and Roy's imaging of Comet Hartley-2 the last month. She showed this after the meeting adjourned.

ADJOURNMENT: Adjournment came at 8:34 PM. We thank our host Harry Harker for the pulled pork sandwiches, potato salad and chips. Rosemary supplied the delicious desserts (cheesecakes). Pandian grilled-up some of his famous curry chicken strips. Even a full belly couldn't resist these. The next meeting will be at YSU on November 20, 2010. Meeting begins after the 8:00 PM show. Scheduled host is Bill Pearce. **PASSWORD:** Give us the biggest size telescope you have ever looked through.
-minutes by Phil Plante

MVAS REMINDERS

Remember those Christmas Raffle tickets. Your support is much appreciated. Please get returns in to the MVAS Secretary or Treasurer before Dec. 5th if delivery is by mail. You may also do this in person at the November meeting or even at the Christmas party before dinner.

The Christmas Party and Annual Meeting will be on December 11 at 6:00 PM. It will be in Boardman Park, same as last year. Dinner is \$10 per person. It is preferred that you make reservations by December 5th -prepaid. Like raffle ticket returns, reservations can be turned in at anytime via mail to either the secretary (see *Meteorite* return address) or to MVAS Treasurer Steve Bartos. You may also submit reservations at the November meeting. We appreciate your compliance with this. It is not too early to get this done so decide as soon as possible if you will attend. We will also have officer elections at the December meeting- after dinner.

Officer elections will be held in December. Positions of President, Vice President, Treasurer and Secretary are up for election. Feel free to throw your name in for consideration. In addition, we will need candidates that would like to be considered for *Appointed Trustee*. This single position will be appointed by the new administration (officers). It is good to have more than one person to consider. At the January meeting, the general membership, present at this meeting, will vote for an Elected Trustee. This person will serve as a representative of the general membership. It would be best to have a slate of names available for this *Elected Trustee* vote, in hand, at the

December meeting. They would be announced at that time, giving the membership time to think on it over Christmas break. So please step up to the plate and pick a spot to serve the MVAS. We thank all that participate.

RASC Handbooks have been ordered. There should be 16 available at the November meeting. First come first served. Going price should be around \$20. It is expected they will cost the same as last year.

2011 Dues can be paid starting now. They officially should be paid-up by the January meeting so this may be one last thing to get over before the New Year starts. You may pay 2011 dues at the next two meetings or send them in with ticket/reservation payment. Again your support is much appreciated.

MVAS ACTIVITIES

SCARE-CREW

Driving down to the observatory, I could see the parked cars by the 16" and 12" buildings. It was almost dark; the 16" building outside lights were on. The eerie red glow of the lights certainly spoke of Halloween. I spotted a shadowy, ghostly figure standing on the front porch as I pulled into a parking space next to the 12" deck. Getting out of the car, I saw the figure had vanished. Grabbing my camera and costume gear I went inside. The food table was in full use. Various crock pots screamed out into the night, "Put a fork in me, I'm done". But almost drowning this out was the flat screen LCD. An assembly of seven spooky ghouls were watching it. A few were eating bowlfuls of the various witches brew that bubbled in that menagerie of crock pots. I noticed two telescopes. The Kecks were here! Alas, the grass skirts did not mask their identity for long. Ma and Pa Kettle sat quietly, absorbing the activity. An Ohio State enthusiast was ready for action (no Bob, not you this time). Spoon-boy was in control of the monitor. I put on my costume-luckily it was almost in tune. Ded Zeppelin had arrived. I played the music no one could hear. Just as Iron Man 1 began to play on the 42" monitor, the Great Pumpkin showed up. But he was disguised as an astronomer bearing laser collimators. Tricks or treats? It was getting interesting.

In short order, Dracula arrived. His offering of grilled, curried chicken put a spell on everyone. (that means yum!). Darth Vader, a vampire victim, a doctor and his wife Shirley also stopped in. Two eclipse chasers were on hand; Recalling their 1991 chase in Hawaii- but they skipped the grass skirts this time. A tired nurse arrived, surely with great tales of work horrors to unleash. We were spared the fright. Finally two Beer Meisters showed up, with no beer. They claimed to be the fearless leaders of this motley scare-crew.

All kidding aside, this was the best attended Halloween Party the MVAS has pulled off. We had nineteen people show up! The sky even cooperated as it cleared up nicely. The 8" building was opened and one by one the ghouls went out to look at Jupiter. Iron Man 2 finally made it to the big screen. A group photo was taken between flicks. All the food was excellent, the cheesecakes and other dessert snacks hit the spot. If there was any doubt, we will have the 6th Annual Halloween party in 2011. With luck, we'll have good weather again and even more costumes. That's what the Halloween Party is about. So start planning your costumes.

Observer's Notes.....

Inner Sanctum

Thinking back to my recent observations with the 25" scope, I thought of the estimate I made of variable star RX Lyr. It's near the Ring Nebula which makes for a very nice starting point in getting "there". RX is a Mira type, long period variable with a period of about 248 days. It can get as bright as magnitude 10.9 and as faint as magnitude 16.0. Needless to say you need a really big scope to see it at minimum light of 16.0 mag. The AAVSO had always set aside those observations of stars that were 13.8 magnitude or fainter. They called these "Inner Sanctum Observations". Observers were given separate credit for these observations because of the difficulty in making them. Most notably, one needed at least an 8" or larger scope (usually larger) to see stars near 14th magnitude. A dark sky and steady eyeball are also needed.

When the AAVSO started in 1911, most amateurs had small telescopes. A few ATM's did make 8" and bigger mirrors. Since those days however, the average size of amateur scopes has increased in size. It's common to see 12" and larger scopes at star parties these days. Thanks in part to the SCT revolution in the 1970s and the Dobsonians of the 1980's. Faint observations were becoming more accessible to vso'ers and now carried less fanfare. More observers were now doing Inner Sanctum Observations. That's not to say these observations had lost value. It is crucial to monitor stars at minimum light especially when they drop below visibility in average scopes. But with this new reality in hand, the AAVSO stopped keeping track of Inner Sanctum Observations sometime around 2008.

I was disappointed to hear this because those Inner Sanctum Observations are still tough ones to do- for me anyway. My last observation of RX was with the 25" at the MVCO (I had it at <15.0 mag.). Which leads me to recall my very first Inner Sanctum Observation. I was using the 16" Cassegrain at the MVCO on September 11, 2004. The star was of course RX Lyr! My observation was at 11:11 PM and I had RX as being at 14.5 magnitude. This observation is a bit unremarkable just on its own. It's the circumstances of the observation I remember most.

No one else was at the observatory so the place was all mine. I got RX in the 16" scope; it was nearly overhead and almost a deal breaker. I next grabbed that orange office chair and put it under the eyepiece. I raised the stage so that I was nearly lying flat in the chair with my eye held up close to the eyepiece. Red flashlight and AAVSO chart in hand, I studied the field. I kept the eye at the eyepiece to let it dark adapt at the eyepiece. A trick veteran galaxy hunters use.

After "memorizing" the field I used quick checks of the chart to pin-point RX and comparison stars. I made the estimate, recording it in my variable star records. I decided to spend more time looking at this Inner Sanctum place. As a I lay there absorbing this view I sensed a feeling of being transported to this secret part of the cosmos. It became a real place for me. It's not often one feels like they are looking at a place and not just a two dimensional image. It is easy to feel this while looking at a solar system object or even a galaxy. But a barely visible speck of light? That's a place?

It was weird and unexpected that I would sense this. I started wondering what was going on there. RX is a Mira variable with a spectral classification of Me, which means it is a red giant star. It is on its second pass through the red giant branch of the H-R diagram. All this implies is that at one time it was likely a solar type star. It may have spent nearly 10 billion years on the main

sequence being a "normal" star. Once the hydrogen in the core is used up, "solar mass" stars expand. They begin to pulsate when the now "helium burning" core comes up against a "hydrogen burning" shell surrounding the core. Red giants turn into variables. The Sun will begin this processes in 5 billion years or so. It will likely engulf Earth as it expands. I wondered if RX had any planets during its normal stages. If so, did any escape the expansion? Did any of them have life? Did a civilization make an effort to escape? Did they even have the ability to leave their planet(s)? They would have had time. Where any outer ice planets now being thawed as RX's "habital zone" was pushed outward. Was life just starting there now? What dramas were hiding there, before my eye? I wondered-- was I just remembering some long lost episode of *Star Trek*?

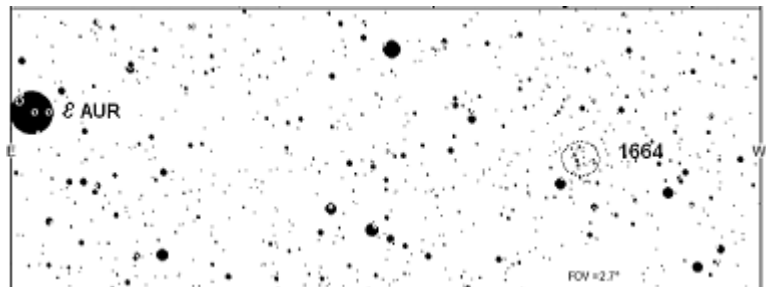
The steady drone of the 16" clock drive eventually brought me back to Earth. Face to face with an amazing speck of light; it makes one think of human destiny. When the Sun starts to go Red Giant, would any human descendants still around, find a way to cooperate and escape? Sometimes the simple joy of looking at the stars can invoke deeper thoughts and questions.

There are a few definitions of Sanctum. One is a religious, sacred place. Another is a quiet, hidden place where one is free from interruption. I can see how such faint stars are in a sacred place, hidden in the depths of the celestial sphere. But then I wonder- when they call it an Inner Sanctum Observation, is it the one in the sky or really the one in the mind?

MVAS Homework:

The featured object is open cluster M38 in Auriga. Just about anyone can find M38- as well as M36 and M37 in a dark sky. Even in 35mm binoculars. We hope you use a telescope to observe and sketch M-38. The other open cluster listed on the homework page is NGC 1664. You'll need at least a 6" scope for a good view. Reports have it being seen in a 4" glass. Since you will be making a variable star estimate of eps Aurigae, you can hop over to NGC 1664. It is about 2° west of epsilon. You'll find it just NW of a 7.5 magnitude star. On the chart, the bright star near center-top is at 6.0 magnitude. The brighter stars in the chart below should be visible in a 50mm finder scope.

Center-in on the 7.5 mag star then put your scope on 1664. At first you might not see anything. Most of its stars are around 10th magnitude. Keep your eye trained. Like a ghost toying with visibility, it will pop in and out of view. Eventually you'll see it steady enough to enjoy it. Many open clusters are like this. Faint and elusive to all that won't spend time looking for them. My first encounter with 1664 was in the early 90's while I was getting familiar with the field for an asteroid occultation. That occultation was eventually clouded out, but I got to know 1664, using my homemade 6" Newtonian. NGC1664 has been called the "Kite Cluster". Being so close to the "Kids", it is almost expected.

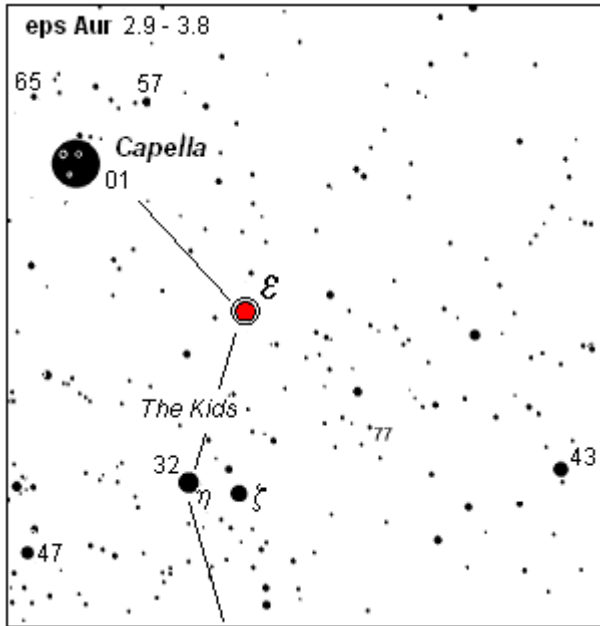


Faintest stars plotted are at 12.5 magnitude.

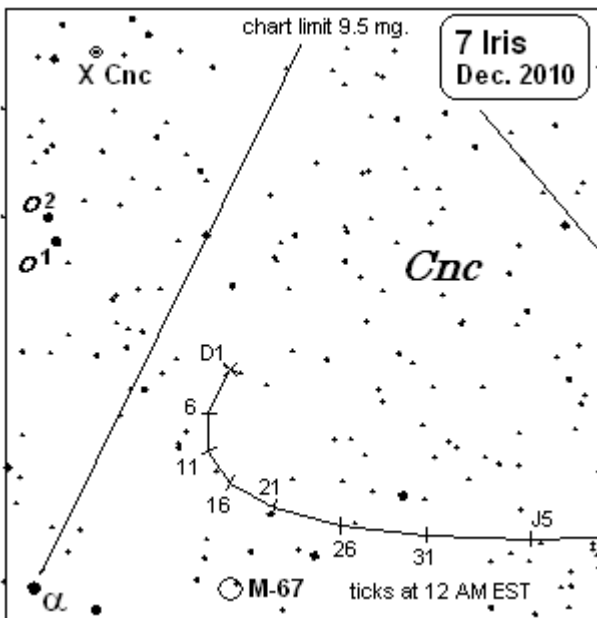
MVAS OBSERVER CHARTS

MVAS OBSERVATIONS - DUE DECEMBER 2010

Variable star of the month: **eps Aurigae** (*abbrev: eps Aur*). Now well into its 2 year long eclipse, it was at mid-eclipse in August. We now see epsilon as faint as it gets. By the end of 2011 it will start to come out of eclipse getting a magnitude brighter. Look now and next year as it won't be this faint for another 27 years. Some of you may still be around...yours truly? Yea right. Probably still doing the *Meteorite!*

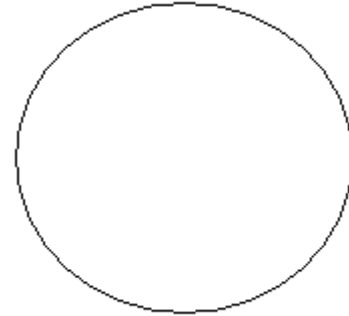


Asteroid of the month: **(7) Iris**. We continue to track asteroid Iris during December. It reaches 8th magnitude by mid-month and should be easy to follow with 50mm binoculars. Assuming your sky is moderately dark. Remember, binoculars are the easiest winter time instrument to haul outside on a cold night. This December you can track an asteroid and check in on an eclipsing variable star- eps Aur. Please have a go at it!



OBSERVER _____

Featured object: M-38. Please try a sketch. A tracking mount helps but it is not needed. Make pencil points for the brighter stars first. Try to place these as accurately as you can, in respect to each other. Then fill-in fainter stars and smudge some graphite to depict the glow you might see. Have fun!



M-38 Observation:

Date: _____ Time(EDT) _____ Scope _____

eps Aur magnitude estimates:

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

_____	_____	_____	_____
_____	_____	_____	_____

(7) Iris Observations:

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

_____	_____	_____	_____
_____	_____	_____	_____

Other Objects in Auriga to observe

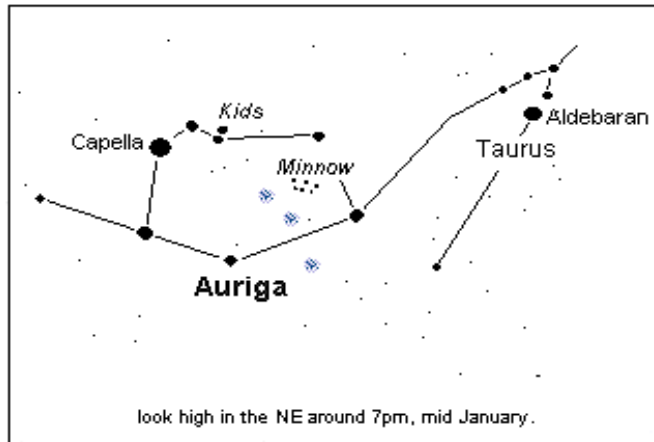
Object	Date	Scope	Object	Date	Scope	Split?
M- 36	_____	_____	ω Aur	_____	4.7"	SEP. Y / N
M- 37	_____	_____	14 Aur	_____	14.1"	Y / N
N- 1664	_____	_____	26 Aur	_____	12.1"	Y / N

Lunar Occultations (see Sky Almanac):

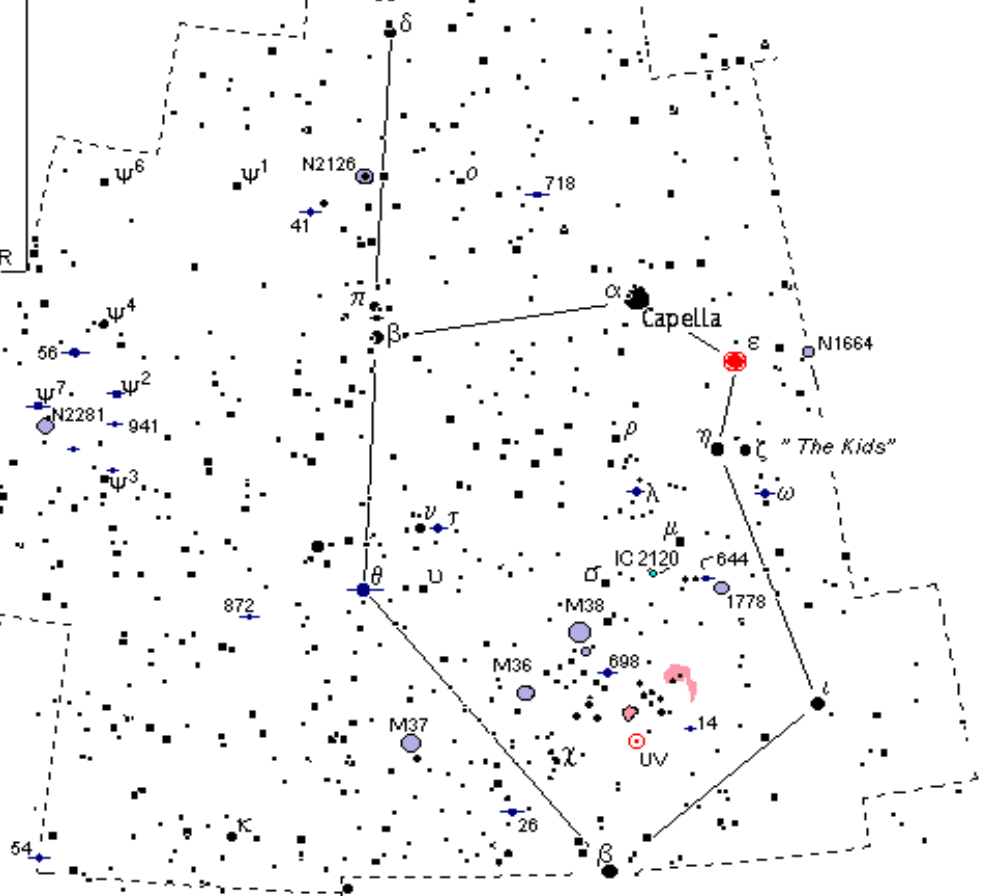
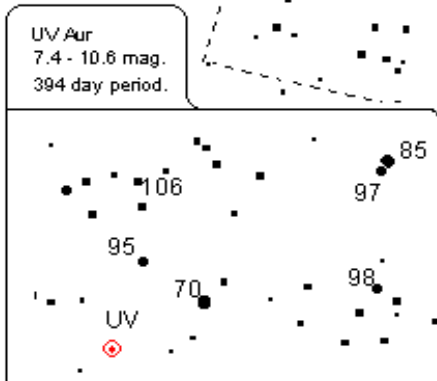
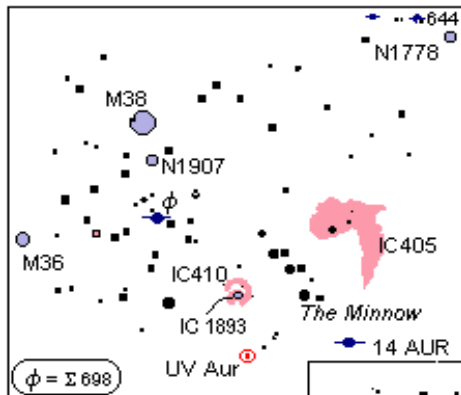
Date (UT): _____ Time(UT): _____ Scope/magx Phenom (circle)

_____	_____	_____	_____x	R D
_____	_____	_____	_____x	R D
_____	_____	_____	_____x	R D

Constellation of the Month — Auriga



Auriga, the Charioteer, is found high in the eastern sky by mid January around 7pm. Look for its brightest star Capella. It has a golden yellow tint and makes a nice color contrast with blue-white β Aur. Look south of Capella and find an ancient asterism called "The Kids", comprised of ϵ , ζ , and η Aur. If the night is very clear and dark, you might detect the three main clusters M36, M37, M38, with the unaided eye. Scanning with binoculars makes them an easy find. These open clusters are all about 4,000 light years away. Central Auriga is a busy place with open clusters, double stars, a few emission nebula and another asterism -- sometimes referred to as "The Minnow". This double row of stars just north of 14 Aur is a nice find in your binoculars. The dusting of stars of the Northern Milky Way passes thru Auriga and makes for pleasant binocular sweeps. With a scope, you'll inspect the clusters up close. NGC 1664 is a faint one in a 6". Depending on the seeing, it fades in and out of view as a ghostly sprinkle of diamond dust. Many fine double stars await the telescope. The colors given below were reported in Webb's "Celestial Objects" first published in 1859. How do your "modern" eyes see them? The emission nebula are visual challenges and probably best used as targets for deep sky imagers. IC 2120, a planetary neb. is involved with two stars. Can be seen in a 6".



DEEP SKY	DOUBLE STARS:	Check list	Instruments used:
M 36 OC 6.0 12' 60 stars	ω 5.1 - 8.1 4.6" green & blue	M 36 _____ 14 AUR _____	_____ on _____
M 37 OC 5.6 23' 150 stars	14 AUR 5.1 - 8.1 14" yell. & orange	M 37 _____ 26 AUR _____	_____ on _____
M 38 OC 6.4 21' 100 stars	26 AUR 5.4 - 8.6 12" yell. & blue	M 38 _____ 41 AUR _____	_____ on _____
N 1664 OC 7.6 18' - - -	41 AUR 6.0 - 6.8 7.7" white & lilac	N 1664 _____ 54 AUR _____	_____ on _____
N 1778 OC 7.7 6' 25 stars	54 AUR 6.4 - 10.4 56" yell. & green	N 1778 _____ 56 AUR _____	_____ on _____
N 1893 OC 7.5 11' 60 stars	56 AUR 5.2 - 8.6 34" yell. & lilac	N 1893 _____ Σ 644 _____	_____ on _____
N 1907 OC 8.2 6' 30 stars	Σ 644 6.7 - 6.9 1.6" gold & red	N 1907 _____ Σ 698 _____	_____ on _____
N 2126 OC 10.2 6' 40 stars	Σ 698 6.6 - 8.4 31" yell. & blue	N 2126 _____ Σ 718 _____	_____ on _____
N 2281 OC 5.4 14' 30 stars	Σ 718 7.5 - 7.5 7.7" - - - -	N 2281 _____ Σ 872 _____	_____ on _____
IC 405 Neb. - - 84' x 60' v. Faint	Σ 872 6.9 - 7.9 11.3" yell. & lilac	IC 405 _____ Σ 941 _____	_____ on _____
IC 410 Neb. - - 25' x 20' v. Faint	Σ 941 7.3 - 8.3 2" blue & purple	IC 410 _____ UV AUR was _____ mag. on ____/____/____	_____ on _____
IC 2120 PN - - 42' very faint		IC 2120 _____ UV AUR was _____ mag. on ____/____/____	

Solar and Lunar (EST).

PLANET WATCH

December 2010

Date	Sunset	Moonrise	Moonset
1	4 : 56	2 : 53A	x : xx
5	4 : 55	x : xx	4 : 50P
9	4 : 55	x : xx	8 : 59P
13	4 : 55	x : xx	12 : 58A
17	4 : 56	x : xx	4 : 00A
21	4 : 58	5 : 30P	x : xx
25	5 : 00	10 : 20P	x : xx
29	5 : 03	1 : 55P	x : xx

MERCURY	JUPITER	SATURN
Sets	Sets	Rises
6:09P	1:13A	2:51A
6:11P	12:58A	2:37A
6:06P	12:44A	2:23A
5:50P	12:30A	2:08A
5:22P	12:16A	1:54A
4:49P	12:02A	1:40A
—	11:45P	1:25A
—	11:32P	1:10A

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 December 2010

(7) Iris

Date	Rises	RA		Alt.	Azm	Magnitude
		hr.	min			
		Dec.				
		deg.				
		topocentric				
1	9 : 38 PM	08 : 50.7	+13.9	25°	093°	8.9
7	9 : 18 PM	08 : 51.8	+13.5	29	093	8.8
13	8 : 55 PM	08 : 51.6	+13.0	33	102	8.7
19	8 : 31 PM	08 : 50.0	+12.7	37	108	8.6
25	8 : 05 PM	08 : 47.1	+12.4	42	114	8.4
31	7 : 38 PM	08 : 42.9	+12.2	46	121	8.3
	EST	(midnight EST)		(at midnight EST)		

Date UT hr **Celestial Highlights**

1	23.0	Mercury elong. E 21°
5	17.6	NEW MOON
13	14.0	FIRST QUARTER MOON
14	5.0	Geminid meteors
19	3.0	Moon 1.3° S. of Pleiades
21	6.6	Total Lunar Eclipse U1
21	7.3	FULL MOON mid-eclipse
22	19	Ursid meteors peak
28	4.3	LAST QUARTER MOON
29	2.0	Algol at minimum

Variable Star of the Month: **eps AUR** 2.9 - 3.8mag 9,892 day period

LUNAR OCCULTATIONS FOR DECEMBER 2010

Civil (24hr) EST			UT			Moon			Star	Star	event	dbl./			
date	hr	min	sec	date	hr	min	sec	Ph	% illum.	alt	azimuth	name	Mag.	PA	sep.
7	18	21	54	7	23	21	54	D	5+	4°	235°	SAO 187425	7.6	92°	NA
8	17	40	38	8	22	40	38	D	11+	19	220	56 SGR	4.9	72°	NA
12	21	51	48	13	02	51	48	D	45+	22	247	ZC 3371	6.4	58°	NA
18	1	45	48	18	06	45	48	D	89+	34	269	47 ARI	5.8	23°	NA
19	21	55	03	20	02	55	03	D	98+	66	129	ZC 716	6.3	131°	NA
22	2	00	36	22	07	00	36	R	99-	68	211	36 GEM	5.3	296°	0.100"
27	2	35	38	27	07	35	38	R	59-	30	126	87 LEO	4.8	280°	NA
29	5	43	38	29	10	43	38	R	35-	30	154	ZC 1918	6.8	338°	NA
31	7	02	16	31	12	02	16	R	16-	21	150	ZC 2183	5.5	289°	NA
-1	19	00	00	x	00	00	00	x	00+	xx	xxx	ZC xxxx	x.x	xxx°	NA
-1	19	00	00	x	00	00	00	x	00+	xx	xxx	ZC xxxx	x.x	xxx°	NA

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 western 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.....

HALLOWEEN PARTY 2010

Here are a few "scary" sights from the party.



Early food table. More would come. All very tasty. (right) One non-MVAS braved the night. Already a victim of a previous vampire. Our own Dracula poses for the camera below. Then Dracula meets Vader. Might not be a feature film (yet), but it's possible they both like the dark side- of night. Especially with clear skies.



The Keck Telescopes made it.



And so did Darth Vader.



Left is a group photo. All photos courtesy of the editor. Group shot was taken by Virginia Bartos- for the editor.

Below: An alien, two beer Meisters and a prankster walked into a bar...actually they lurked in the background... make up your own joke!



Spoon-boy - super chef made an impromptu showing.

Ded Zeppelin haunted from the past.