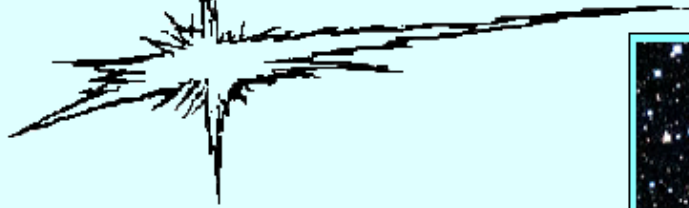


THE METEORITE



M-36

(NGC 1960)

Open Cluster in Auriga



Newsletter of the Mahoning Valley Astronomical Society, Inc.

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MARCH 2013

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



MARCH 2013

NEWS NOTES

Newsletter of the Mahoning Valley Astronomical Society, Inc.

MVAS CALENDAR

- MAR 9** Bino-Blast 2 at MVCO. 7:00 PM. Eats too!
- MAR 23** Business meeting at YSU. 7:30 PM Comet Talk in Room 2030. Meeting after 8:00 PM show.
- APR 10-11** Flying-W camp trip. For those that have signed-up
- APR 20** Chili-fest at the MVCO. 7:00 PM.
- APR 27** Business meeting at the MVCO. 8:00 PM

NATIONAL & REGIONAL EVENTS

- APR 18-19** **NEAIC 2013.** Held prior to NEAF, this meeting is at the [Crowne Plaza Conference Center](#), Suffern, NY. This is the place to be if you are into astro-imaging.
- APR 20-21** **NEAF 2013.** At Rockland Community College in Suffrin, NY. The famous NE convention that includes the NEAF Solar Star Party. <http://www.rocklandastronomy.com/NEAF/index.html>
- JUN 5-7** **Sedona Star Party**, in Sedona, AZ. This annual 3 day event promotes star gazing in Sedona and the Village of Oak Creek. Free to the public. Telescopes will be set up at the Opening Night Festival on June 5 and at other locations in and around Sedona on June 6, from 8pm to midnight. There will be 2 dark sky sites for astronomers and astrophotography. Contact: Clifford Ocher, Sedonastargazing@gmail.com

Still Rockin' Mars rover Opportunity is conducting a walkabout science campaign at different locations around the inboard edge of 'Cape York' on the rim of Endeavour Crater. On Feb. 14, 2013, it was planned to have the rover perform a very small turn to position the robotic arm in search of an acceptable surface target, but a Deep Space Network issue prevented the command sequences from reaching the rover. With subsequent imagery returned from Opportunity, an acceptable target was found within reach of the arm, negating the need for a turn.

On Feb. 17, 2013, Opportunity used the Rock Abrasion Tool (RAT) to brush the surface target 'Maley,' which was then followed by a Microscopic Imager (MI) mosaic and a placement of the Alpha Particle X-ray Spectrometer (APXS) for an overnight integration. Work was complete at this location on Feb. 20, 2013. The rover then drove approximately 120 feet to the southeast towards the rock target 'Big Nickel' to begin an in-situ investigation there. So far, no 'amnesia' events with the Flash file system have occurred since Jan. 6, 2013. Opportunity is otherwise in good health. As of Sol 3226 (Feb. 19, 2013), the solar array energy production was 521 watt-hours. Total odometer is 22.11 miles.

Rock the Vote. The U.S.-led team that discovered two new moons of the dwarf planet Pluto says they're asking the public to vote on potential names for the distant worlds. The fourth and fifth moons of Pluto are currently known simply as P4 and P5. Tradition holds that the names of Pluto's moons are taken from Greek and Roman mythology, related to Hades and the underworld. Pluto's first 3 moons are named Charon, Nix and Hydra (last 2 discovered in 2005). Potential names for P4 and P5 are Cerberus, Hercules and Orpheus.

Astronomer Clyde Tombaugh discovered Pluto in 1930. He chose the name following the suggestion of an 11-year-old girl named Venetia Burney. Mark Showalter of the SETI Institute in Mountain View, Calif., heads the team that discovered the new moon. He stated "I like to think that we are doing honor to Tombaugh's legacy by now opening up the naming of Pluto's two tiniest known moons to everyone," People can vote by visiting <http://plutorocks.seti.org>. The final decision on the names will be up to the International Astronomical Union.

Tail End. It has been likened to Ouroboros, the mythical serpent that bites its own tail. Scientists from NASA's Cassini mission have describe how the massive storm of 2011 churned around the planet until it encountered its own tail and sputtered out. It is the first time scientists have observed a storm consume itself in this way anywhere in the solar system. The storm was first detected on Dec. 5, 2010 when it erupted around 33° north latitude. Cassini's radio and plasma wave subsystem and imaging cameras tracked it. Shortly after the bright head of the storm emerged and started moving west, it spawned a clockwise-spinning vortex that drifted much more slowly. Within months, the storm trail wrapped around the planet at that latitude. It thundered and threw lightning along the way. When the head of the storm ran into (caught-up with) the vortex in June 2011, the massive storm faded away. Why the encounter would shut down the storm is still a mystery. The vortex grew to be as large as Oval BA on Jupiter. But then, Oval BA and the Great Red Spot are not thunder-and-lightning storms.

MVAS BOARD OF TRUSTEES

- | | |
|---------------------------------|-----------------|
| President | Lou DiNardo |
| Vice President | Rich Mattuissi |
| Treasurer | Steve Bartos |
| Secretary | Phil Plante |
| Appointed Trustee (2013 & 2014) | Bob Danko |
| Appointed Trustee (2012 & 2013) | Rosemary Chomos |
| Elected Trustee (2013) | Dave Ruck |

OBSERVATORY STAFF

- | | |
|--------------------------------|-----------------|
| Observatory Director | Bob Danko |
| Assistant Observatory Director | Larry Plante |
| Librarian | Rosemary Chomos |

PUBLICATIONS STAFF

- | | |
|---------------------|--------------|
| Meteorite Editor | Phil Plante |
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| MVAS Webmaster | Harry Harker |

MVAS REPRESENTATIVES

- | | |
|---------------------|--------------|
| OTAA Representative | Harry Harker |
|---------------------|--------------|

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

MINUTES OF THE FEBRUARY MEETING

FEBRUARY 23, 2013 at YSU

Due to the consecutive musical laser light shows running in the planetarium all evening, it was necessary to conduct the meeting in classroom 2030. In any case, it was an unusual sight seeing almost 200 people in the hallway, waiting to get into the planetarium. Several members had a chance to see a few shows. Skipping the 8:00 PM show and meeting in the classroom allowed us to begin the meeting earlier than usual. President Lou DiNardo called the meeting to order at 8:03 PM. Roll Call was taken. Twenty-nine members gave the password. Around 45% preferred summer months to observe in, 25% preferred spring months, 20% winter months, and 10% preferred fall or any clear night we get. We had six guests on hand: Virginia Bartos, Dominic and Nick Mattuissi, Kaden Ostheimer and Don and Bernice (missed last name).

There was a call for the reading of the Minutes. Rosemary Chomos moved to suspend the reading. A second to the motion was made by Bob Danko. Without further discussion a unanimous voice vote adopted the motion. The Minutes are hereby accepted as published.

TREASURER'S REPORT: The Report was read by Steve Bartos. Without further discussion a motion to accept the report was made by Dennis Marko. Chuck Iliff made a second to the motion. By a unanimous voice vote, the motion passed.

General Fund 1/1 thru 1/31 2013

OPENING BALANCE:	\$	9,508.12
CLOSING BALANCE:	\$	9,758.28
AVAILABLE FUNDS (NON-RESERVED):	\$	5,594.16
ACCOUNT NET GAIN/LOSS FOR THIS PERIOD:	\$	+250.16

INCOME:

DONATION (WARREN YOUNG)	\$	200.00
DUES (2013)		50.00
INTEREST		<u>0.16</u>
TOTAL INCOME	\$	250.16

EXPENSES:

CK# ---- NO EXPENSES RECORDED	\$	0.00
TOTAL EXPENSES	\$	0.00

Reserved Funds

KEY DEPOSITS (MVCO KEYS)	\$	250.00
CASH FROM ORIGINAL OAD FUND (FOR LAND)		3,914.12
TOTAL RESERVED FUNDS	\$	4,164.12

2013 DUES PAID: Richard and Eric Klesch (family rates). Thanks guys!

CORRESPONDENCE: Bob Danko brought a coupon offer from Chase Bank to receive \$150 if we opened an account. A \$10,000 minimum deposit was required. We don't have that and it was pointed out this account might be for corporate accounts like we would require. Bob left the NASA Night Lights package at the MVCO. Steve had a flyer from a company that did custom inscribed pens for us before. This time it was for a key chain LED flashlight. This item might be we should consider getting for the MVAS 75th anniversary celebration.

COMMITTEE/OFFICER REPORTS: IMAGING COMMITTEE: Lou reported that he, Jodi and Roy McCullough would be attending the 1st North East Ohio Imaging conference which is being initiated by Mike Unsold, of software fame. He spoke of the ongoing collaboration he is having with the McCullough's

accepting their raw images, which he then processes. He added that Mike Heim has provided access to his server to make that imaging data available to Lou.

VISUAL COMMITTEE: Phil had Visual Committee forms (left from 2012) and hoped members would take some and fill them in the best they can. Take as many months as needed to fill it in. He also reminded members to do their Homework, as much as they can. Members should turn in both Visual Committee and Homework forms in to Phil during this segment of the meeting.

LIBRARIAN: Rosemary has not had a chance to bring new books to the Terry Biltz Library yet. It is too early (damp) to do so. A passing note: She will only turn on the refrigerators for the March Bino Blast if we have warmer weather. So be prepared to take home any food or drink you bring to the event.

OBSERVATORY DIRECTOR'S REPORT: Bob Danko went to the MVCO earlier in the day. He reports that at least three ceiling tiles need to be replaced due to water damage. He also suggested we need to repair the west side fascia before we do the gutters. This will likely be part of the contractor's repair bill. Lastly, Bob recommends we replace the wooden 12" building door with a steel or fiberglass door. It seems this door swells up during winter and the door won't open; as is the case currently. It was pointed out that Star supply has steel doors for about \$40 but any new door would have to be cut to fit the 12" building doorway. Other than these items, the MVCO is holding up well.

Larry was there some weeks ago and found that the road sign had fallen off the frame and was lying on the ground. Apparently swinging action over the years, due to wind, had caused the attachments to wear down and finally break through. He had the sign at home to repair it and repaint it. Larry told of some gear box motors he had found at Star Supply. These were used and went for \$150. New from Grangers would cost upwards of \$600. This type of motor is what is needed to motorize the dome. Since this project has been on the books for almost 12 years, Phil Plante moved that we obtain a motor for such use. Maryanne Hoffman seconded the motion. The motion passed by voice vote.

OLD BUSINESS: First up was the proposed camping trip to Flying-W Ranch. Larry needed to know who would be going and would need payments up front. Reservations would need to be made within a few days of the meeting. This would be settled after the meeting. Maryanne had two cards that would be delivered to Elaine Pearce as part of the MVAS bereavement gift. One was for personalized messages and one for membership signatures. A collection was taken during and after the meeting, which was added to the standard MVAS \$50 gift. Rich Mattuissi was planning to visit Elaine the next day and would deliver these items to her. All were reminded that Bino Blast 2 would take place on March 9th at the MVCO. If it is cloudy we should still meet to have a food session. Unless the MVCO is snow bound this event is on.

The Chili-fest is set for April 20. We will have a drawing as last year. Anyone that brings chili is entered to win the prize. We will dispense with picking the best brew. Prize has not been determined yet. Stay tuned. Phil reported that the MVAS merchandise order came to \$1,081. We are stocked up again, now with patches, sweat shirts and new expensive ball caps. Prices may change (go up) on some items. A list or catalog is planned for the Meteorite. Due to the chaos of this meeting, and being one of the hosts, the merchandise is still at Phil's as it was impossible to bring it all. He will bring the clothing to the March meeting.

NEW BUSINESS: Jodi reminded the group that there is a list of astronomy equipment up for sale that is from Bill Pearce's estate. It will soon be posted on AstroMart. Contact Jodi or Don Durbin if you need to see the list or wish to purchase something. The proceeds go to Elaine and the Pearce family. There are some books that Bill had that may end up at the MVCO. Lou asked about the 50" mirror and what we should do about it. Bob Danko suggested we get rid of it. Dan Schneider agreed. There was a short discussion about the history of the mirror. It was obtained for free in 1971 from Corning Glass in New York. Phil is still opposed to selling it. There is no harm having it in our possession. Phil pointed out there may be a right time or opportunity that comes up to complete the mirror. Such was the case in the mid 90's, but quick access to the mirror was next to impossible. Opportunity lost. The Trustees will discuss the future of the mirror.

Jodi has contacted Tom Fields from "Speakers On-line", a service that provides speakers via the internet. They speak to various astronomy groups with Q&A sessions. (see pg. 32 of the March S&T for the article "Webinars" that describes the program) Jodi would like to have Mr. Fields give a talk on spectroscopy imaging and analysis during our OTAA meeting in August. Mike Heim moved that she go ahead and make arrangements. Dan Schneider seconded this. Unanimous approval was the resulting vote. It was reported that Harry would have the internet back on at the MVCO by then. Jodi also said that she would give a short talk on comets (Comets 101) before the March meeting at YSU. It will be in the same room as this meeting (room 2030) and would commence at 7:30 PM. This should give us time to go see the 8:00 PM show, as usual.

GOOD OF THE SOCIETY: Rosemary brought up the astronomy weekend in August to be held in Hawking Hills Park near Columbus, OH. They have "astronomy cabins" and she thinks it may happen the same weekend as our OTAA. It might be worth investigating for other times. Check their website at www.GetawayCabins.com. Dennis Marko wants to visit Telescope Park in June. It is likely the Chagrin Valley (CVAS) group will have this as their OTAA event. This may be the time to go. Most likely June 8th as this is new moon weekend. Phil reported that Chris Stephan (Honorary MVAS Member) is planning to moving back to Ohio this summer. He may be here for the summer meetings- even the OTAA meeting.

VISUAL REPORTS: Phil managed 10 variable estimates using binoculars. Mike Heim observed Jupiter visually and saw the NTeB for the first time. Chuck Iliff watched a NASA video feed of the asteroid 2012 DA14 close flyby on February 15. Lou watched the ISS pass over using binoculars. He noticed how deep red it got as it got lower in the sky. Jodi and Roy did visuals of Mars and Mercury using binoculars. Steve mentioned a twitter message about a storm on Saturn called "Cyclopes".

Comet PanSTARRS is coming in a few weeks; it will be low on the horizon and not visible from the MVCO. The night of the Bino Blast would be a good opportunity to view it. Bob Danko plans to go to Grand River- about 15 miles north of the MVCO, to watch for the comet. There are tentative plans to meet at the MVCO and drive to Grand River well before sunset. The comet sets soon afterward. Then all would drive back to the MVCO for the Bino Blast and eats. All depends on clear skies of course. This is an email group- "game time" decision.

ADJOURNMENT: Adjournment came at 8:59 PM. We thank our hosts Steve and Virginia for the delicious lasagna, Phil for the "starberry" shortcake and Larry for the sodas. The next meeting

will be at YSU on March 23, 2013. Comet talk will be in room 2030 at 7:30 PM. Then we transfer to the planetarium for the 8:00 PM. Our business meeting follows the show. Scheduled hosts are Ed & Sheila Bishop (meal), Mark Baker (dessert), Maryanne Hoffman (drinks). **PASSWORD:** Tell us your favorite observing session snack and/or drink. *-minutes by Phil Plante*

MVAS REMINDERS

Be aware that 2013 membership dues need to be paid by the end of March. You will be dropped from the roster after that. We value your friendship as well as being fellow members in the MVAS. Astronomers seem to have much in common, beyond star gazing and study of the universe. Membership provides the opportunity to grow and learn from each other. Well worth the membership fee, I'd say.

Stay tuned to e-mails concerning the Bino Blast event on March 9th and plans to view PanSTARRS earlier in the evening prior to sunset. Bring your own food and drink or to share. Please be prepared to bring leftovers back home. Even if the refrigerators are on! We have the chili-fest coming up on April 20th. No need to have things cluttered up already. Now is a good time to practice your recipe. Hot chili is still ok. Something super, super hot, so that Rich can enjoy it. If you do- please label as "hot". Remember, only those that bring a pot-o-chilli will be entered into the raffle to win a prize. (a bottle of Pepto?)

MVAS ACTIVITIES

In a Bulletin: Chris Stephan sent notice that his eclipsing variable star observations have been included in Variable Star Bulletin #55, Feb. 2013: Visual and CCD minima of eclipsing binaries during 2012. This bulletin is published by the Variable Star Observers League of Japan, (VSOLJ). Doing a tally, Chris was one of 36 observers that submitted observations (the only American?). He submitted 26 total observations, made on 21 separate stars (double vso's on a few). There were 422 observations listed. Chris' 26 vso's amounted to 6% of the total. Congratulations to Chris for the outstanding work. We should be proud to have an international observer in our ranks. If you wish to see the entire PDF report, visit this website:

<http://vsolj.cetus-net.org/vsoljino55.pdf>

Chris' observer code is "SET". Look for his designation.

MVAS Merchandise: Here is a price list. We all know the designs / logos and shirt colors. They are all still the same.

Hoodies:	Price remains the same.	\$25.00 ea.
Sweat shirt :	(hoodie design) New item.	\$16.00 ea.
Polo shirt:	Price remains the same.	\$25.00 ea.
Mock Turtle:	Price remains the same.	\$25.00 ea.
T-shirts, all:	Price remains the same.	\$10.00 ea.
Knit hats:	Price remains the same.	\$10.00 ea.
Stretch caps:	New item ball cap.	\$16.00 ea.
Regular caps:	Price remains the same.	\$10.00 ea.
MVAS Patches:	(hat logo) New item.	\$ 6.00 ea.

Polo shirts with a pocket are possible. They will be ordered next time. We seem to have enough items as it is!

Observer's Notes.....

AAVSO Binocular Program

Recently it seems that binoculars have become popular instruments for MVAS observers. They do feature ease of transport, set-up and comfort in use. You can't argue with that! These binocular attributes have been known for generations. Likewise each generation of veteran observers eventually reach the same mode of operandi; the instrument of choice gets smaller the older one gets. But whether you are a novice or crafty old stargazer, we should consider that very useful science can be done with these humble optics. For example, I have used 70mm binoculars to make magnitude estimates of Uranus and Neptune. Remote Planet research with binoculars! I've used those same 70mm's to make over 660 variable star estimates since 1997. With that said, many of the variable stars I've featured in the *Meteorite* "Home Work" section are such binocular variables that I have followed. So it can be done!

It has come to pass that recently, the AAVSO has introduced a Binocular Program. Aimed at making variable star estimates with binoculars. In case you are unfamiliar, the AAVSO is the American Association of Variable Star Observers and they have collected amateur observations since 1910. They had over 23 million observations submitted as of mid February 2013. The tally grows by the millions each year, now that mass electronic measurements are becoming more common. To be sure, the AAVSO provides professional astronomers access to this data that was collected by folks like you! The following is from their website describing the program.

"The AAVSO Binocular Program consists of 153 stars in the northern and southern hemispheres. They are mostly semi-regulars and Miras, with a few other types sprinkled in. Most of the stars range between 3.0 and 9.5V and can be observed best using simple hand held binoculars. The sequences for these stars have been specially selected for use with binoculars and all the "Binocular Charts" will display only those comparison stars selected for the sequence for that star. You may still need to plot your own finder charts or use a star atlas to locate these stars in the sky at first, but once you learn them you will only need the comparison star charts."

You probably don't know how to make estimates. Perhaps you are intimidated, or lack confidence or even interest. Just remember that telescopes probably intimidated you when you got started. Same thing with variables. You just need to get comfortable with the process. The interest will grow as well. Basically you locate the variable and then two comparison stars. Comp stars are on the same chart, near the variable star. Their magnitudes are indicated next to them. Find one brighter and one dimmer than what the variable seems to be. Then just make your best guess what magnitude the variable is at between those comp stars. You'll get more accurate with time and practice. You can find more information and instructions on the AAVSO website: <http://www.aavso.org/>

At the website, you will be able to print out the AAVSO observing charts that you need. They will have the variable star data as well as comp stars plotted on the charts. Very handy! Just click on the "Observers" link, then click "Variable Star Plotter" or VSP. You need to type in the variable name at the top. Select chart scale to "A". Set for north up and east to the left. Set magnitude limit to 10 or 11. Set to show only this star. At the bottom of the VSP page click yes for "binocular chart".

You can play around with the parameters to get an idea of what to expect or customize to your preference. Then print or save to a file to print later. Just remember that most variable names start with one or two letters (from R to Z) or (RR to ZZ). This is followed by the constellation abbreviation such as Ori, Gem, Sco, Vir, etc. Here is a short list you might try.

Star	Period	Mag. Range	Chart size	& mag limit.
EG And	irreg.	6.97 - 7.8 V	180 arcmin	9.5
W Ori	212	5.5 - 6.9 V	480 arcmin	8.5
BU Gem	325	5.74 - 7.4 V	660 arcmin	8.5
W Cma	160	6.27 - 7.09 V	420 arcmin	8.5
X Cnc	180	5.69 - 6.94 V	5 deg.	9.0
R Leo	309.95	4.4 - 11.3 V	660 arcmin	9.0
X Her	102	5.8 - 7.0 V	660 arcmin	8.5
SS Vir	361	6.0 - 9.6 V	480 arcmin	10.0
R Sct	146.5	4.2 - 8.6 V	540 arcmin	9.5
X Oph	338	5.9 - 9.2 V	630 arcmin	9.0

If you scroll down on the Observer's page you should see the link to "New AAVSO Binocular Program". There you'll find the whole list of binocular variables. Have fun! -P. Plante

MVAS Homework: M-36

Giovanni Battista Hodierna (1597-1660) was an Italian astronomer at the court of the Duke of Montechiaro. He compiled a catalog of about 40 entries which had at least 19 verifiable nebulae. It was a catalog of objects that might be confused for comets. This little known work anticipated Messier's catalog, and it seems Messier was un-aware of it. So we now know that M-36 had been recorded sometime before 1654. Ninety-five years later, Le Gentil, a French astronomer at the Paris Observatory re-discovered M-36 in 1749, along with other objects. The M-36 discovery was presented to the Paris Royal Academy of Sciences that same year. Le Gentil's complete work was finally published in 1765, but Messier added M-36 to his catalog on September 2, 1764.

With that, M-36 is the brightest of the three open clusters that line-up across Auriga. M-36 is about 4,100 light years away by most estimates. This would make its 12 arcminute size equivalent to an actual diameter of 14 light years. It is a fairly young cluster being about 25 million years old. Of the 60 confirmed members of the cluster, none are red giant stars which are old stars billions of years old. These hot, young cluster show evidence of rapid rotation which is indicated by the broadened spectral lines they show. The brightest stars shine around 9th magnitude (apparent). This is very similar to the stars in the Pleiades. If M-36 were as close as the Pleiades, about ten times closer, it would appear very similar to the Pleiades and would be conspicuous in the night sky.

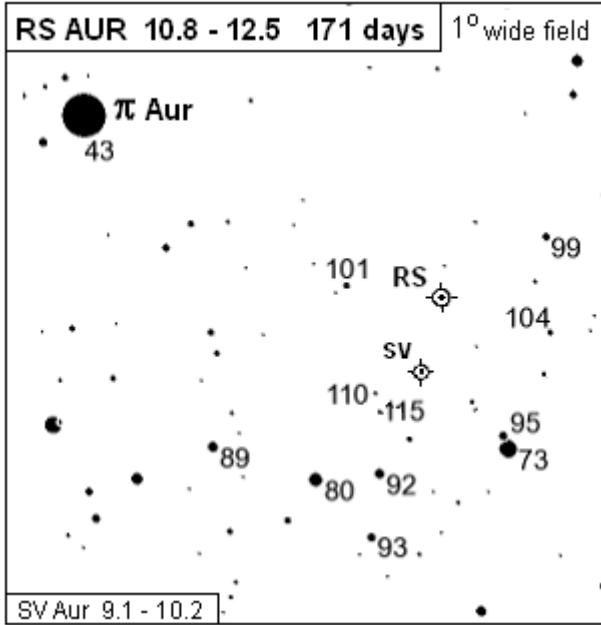
With warmer nights of spring on the way, now is a good time to catch M-36 and Auriga high in the western sky. Now is also a good time to try sketching. With a tracking scope it should be easy enough to make pencil points on the Homework circle. No nebulosity to sketch (smudge)! Let's see some of your work!

HELP! Please turn in Homework and/or Visual Reports during the *Committee Reports* segment of the meeting. **Here is a request** to submit a short article for Observer's Notes. This is your newsletter and you are welcome to share your tips, best observations, observing results or "war stories". Thanks in advance. Contact Phil for more information, topic advice- etc.

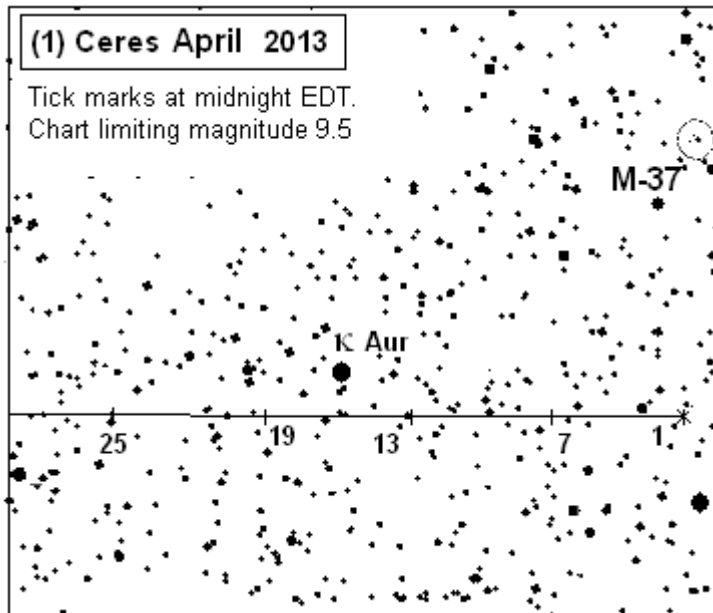
MVAS OBSERVER CHARTS

MVAS OBSERVATIONS - DUE APRIL 2013

Variable star of the month: **RS Aurigea** (*abbrev: AR Aur*). Sorry, this variable will need a scope. Find it about 40' SW of π Aur - which is about 1° south of β Aur. Use β as your starting point for star hopping. The listed blue photometric magnitude range sounds like a challenge (10.8 to 12.5). But typical visual observations find it ranges from 9.2 to 10.8. While you're in the area, check in on SV Aur to the south. It has a similar blue range of 10.8 to 11.6 magnitude. There is no stated period for SV. It's believed to be a slow irregular red variable. Visual observers find that SV varies from 9.1 and 10.5 magnitude.

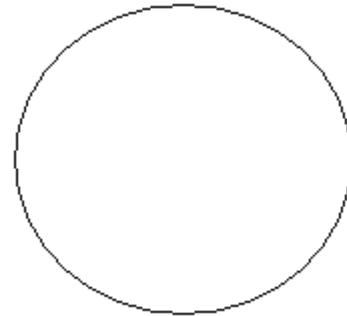


Asteroid of the month: **(1) Ceres**. April is the last month we'll track Ceres in 2013. It drops from 8.6 to 8.8 magnitude this month; barely detectable. Should be visible in 50mm binoculars in dark skies. It passes south of kappa Aur from April 13-19. Star hop from M-37...



OBSERVER _____

Featured object: M-36 Keep M-36 centered in the eyepiece and place pencil points to represent the brighter stars, all in proper relation to each other within the eyepiece field of view (the circle below). Once you have that reference system drawn, fill in the fainter stars with properly positioned smaller pencil points. Use heavier points for bright stars, smaller points for fainter stars accordingly. Like a star chart. Easy enough!



M-36 Observation:

Date: _____ Time(EDT) _____ Scope _____

RS Aur magnitude estimates:

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

(1) Ceres Observations:

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

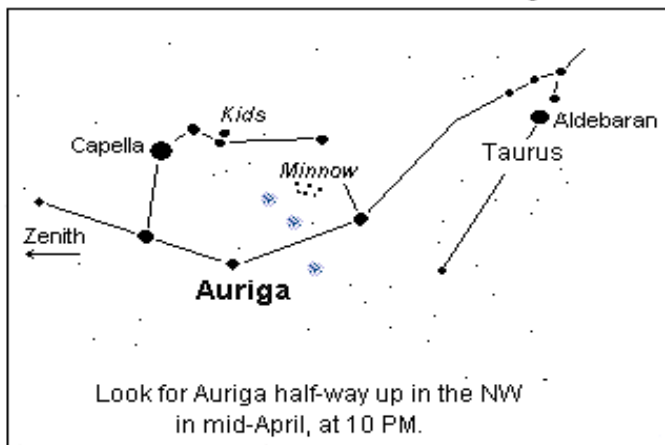
Other Objects in Auriga to observe

D. Sky	Date	Scope	Dbl.	Date	Scope	SEP	MAG	SPLIT?
M- 37	_____	_____	Σ 698	_____	_____	31.0"	6.8 - 8.4	Y / N
M- 38	_____	_____	14 Aur	_____	_____	14.0"	5.1 - 8.1	Y / N
N- 1893	_____	_____	Σ 644	_____	_____	1.6"	6.7 - 6.9	Y / N

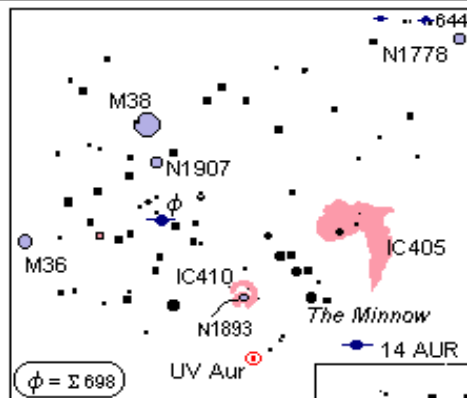
Lunar Occultations (see Sky Almanac):

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

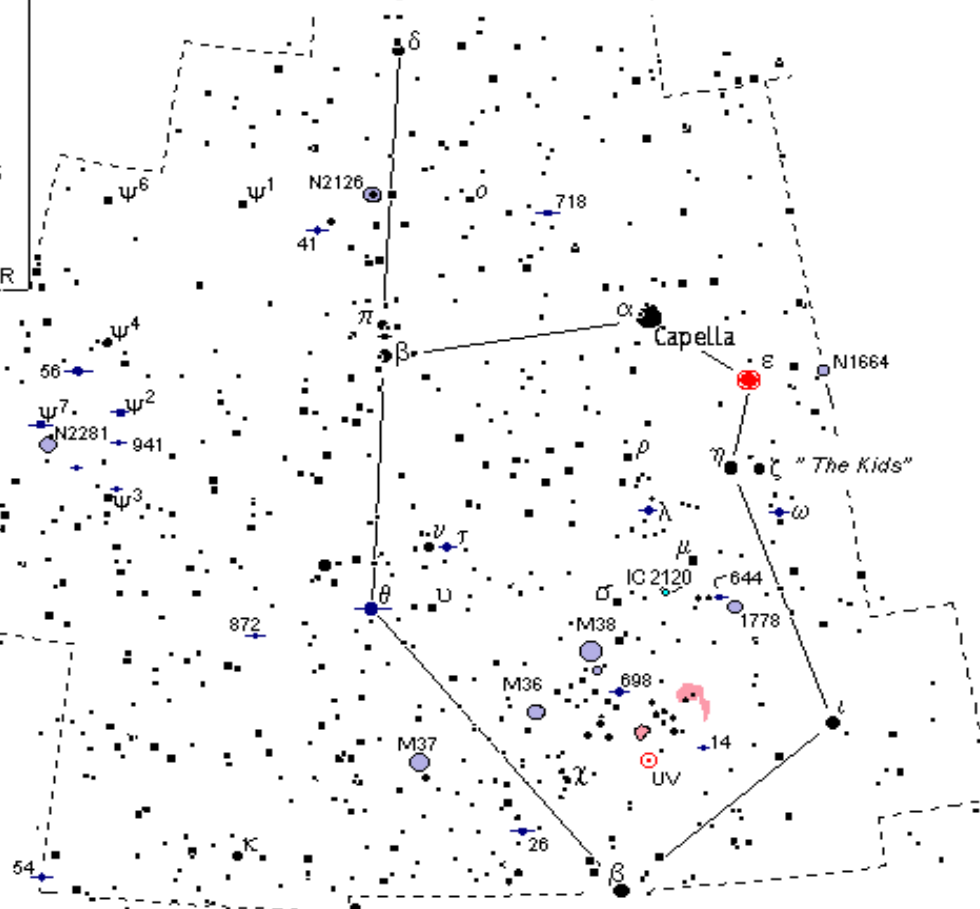
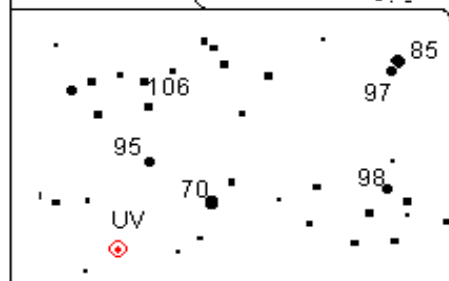
Constellation of the Month — Auriga



Look for Auriga's brightest star Capella. It has a golden yellow tint and makes a nice color contrast with blue-white β Aur. Look below 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".



UV Aur
7.4 - 10.6 mag.
394 day period.



DEEP SKY					
M 36	OC	6.0	12'	60	stars
M 37	OC	5.6	23'	150	stars
M 38	OC	6.4	21'	100	stars
N 1664	OC	7.6	18'	---	
N 1778	OC	7.7	6'	25	stars
N 1893	OC	7.5	11'	60	stars
N 1907	OC	8.2	6'	30	stars
N 2126	OC	10.2	6'	40	stars
N 2281	OC	5.4	14'	30	stars
IC 405	Neb.	--	84' x 60'	v.	Faint
IC 410	Neb.	--	25' x 20'	v.	Faint
IC 2120	PN	--	42'		very faint

DOUBLE STARS:					
ω	5.1 - 8.1	4.6"	green & blue		
14 AUR	5.1 - 8.1	14"	yell. & blue		
26 AUR	5.4 - 8.6	12"	yell. & blue		
41 AUR	6.0 - 6.8	7.7"	white & lilac		
54 AUR	6.4 - 10.4	56"	yell. & green		
56 AUR	5.2 - 8.6	31"	yell. & lilac		
Σ 644	6.7 - 6.9	1.6"	gold & red		
Σ 698	6.6 - 8.4	31"	yell. & blue		
Σ 718	7.5 - 7.5	7.7"	----		
Σ 872	6.9 - 7.9	11.3"	yell. & lilac		
Σ 941	7.3 - 8.3	2"	blue & purple		

Check list		ω
M 36	___	14 AUR
M 37	___	26 AUR
M 38	___	41 AUR
N 1664	___	54 AUR
N 1778	___	56 AUR
N 1893	___	Σ 644
N 1907	___	Σ 698
N 2126	___	Σ 718
N 2281	___	Σ 872
IC 405	___	Σ 941
IC 410	___	UV AUR was ___ mag. on ___/___/___
IC 2120	___	UV AUR was ___ mag. on ___/___/___

Instruments used:

_____ on _____

_____ on _____

_____ on _____

Solar and Lunar (EDT).

Date	Sunset	Moonrise	Moonset
1	7 : 49	12 : 59a	— : —
5	7 : 53	04 : 10a	— : —
9	7 : 57	— : —	7 : 33p
13	8 : 02	— : —	11 : 27p
17	8 : 06	— : —	01 : 45a
21	8 : 10	— : —	03 : 59a
25	8 : 14	— : —	06 : 11a
29	8 : 19	— : —	09 : 42a

PLANET WATCH

Jupiter	Saturn	Mercury
Sets	Transits	Rises
12:53a	3:19a	6:13a
12:40a	3:02a	6:09a
12:28a	2:46a	6:06a
12:16a	2:29a	6:04a
12:04a	2:12a	6:02a
11:49p	1:55a	6:00a
11:37p	1:28a	6:00a
11:25p	1:21a	6:00a

April 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 April 2013 (1) Ceres

Date	Rises	RA		Dec.		(Topocentric)		
		hr.	min	deg.	Alt.	Azm	Magnitude	
		topocentric						
1	6 : 38 pm	05	54.9	+28.8	26°	287°	8.6	
7	6 : 23 pm	06	02.3	+28.9	23	289	8.7	
13	6 : 08 pm	06	11.8	+28.9	20	291	8.7	
19	5 : 53 pm	06	20.9	+28.9	18	293	8.7	
25	5 : 39 pm	06	30.4	+28.9	15	295	8.8	
30	5 : 27 pm	06	39.8	+28.8	13	297	8.8	

Date UT hr Celestial Highlights

2	00	T UMa at max. 7.7mg.
2	00	R Boo at max. 7.2mg.
3	04	LAST QUARTER MOON
10	09	NEW MOON
10	00	Euterpe at opposit. 9.8m.
10	00	S UMa at max. 7.8mg.
18	12	FIRST QUARTER MOON
22	11	April Lyrids Moon: 87%
25	20	FULL MOON
28	08	Saturn at opposition

Variable Star of the Month: **RS AUR** 10.8-12.5 171 days

LUNAR OCCULTATIONS FOR: APRIL 2013

Civil (24hr) EDT			UT			Moon	Moon	Moon	Star	Star	event	dbl./			
date	hr	min	sec	date	hr	min	sec	Ph	% illum.	alt	azimuth	name	Mag.	PA	sep.
3	5	18	54	3	09	18	54	R	47-	21°	143°	ZC 2794	6.6	241°	0.10"
3	5	25	40	3	09	25	40	R	47-	22	144	ZC 162239	7.0	300°	NA
14	22	13	23	15	02	13	23	D	19+	21	279	ZC 7236	7.5	051°	0.96"
15	22	43	50	16	02	43	50	D	27+	24	275	ZC 95031	7.9	120°	NA
16	20	40	34	17	00	40	34	D	36+	53	241	ZC 9603	7.8	167°	NA
16	22	44	43	17	02	44	43	D	36+	32	267	ZC 1040	6.4	084°	0.34"
21	0	56	36	21	04	56	36	D	75+	35	246	ZC 1482	6.2	061°	0.100"
22	1	06	47	22	05	06	47	D	84+	35	234	55 LEO	5.9	180°	1.06"
24	0	10	29	24	04	10	29	D	96+	41	185	CHI VIR	4.7	042°	0.100"
27	3	10	49	27	07	10	49	R	97-	29	188	41 LIB	5.5	302°	NA
27	4	53	01	27	08	53	01	R	97-	22	213	kappa LIB	4.8	244°	171.0"

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=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.....

Curiosity.. about the Martian landscape.



A photo of the extended instrument arm. Taken 08/ 20/2012.



Photo of Mt. Sharp. The triangular peak at center is about 300 ft high and 1,000 ft. across.



The alpha particle X-ray spectrometer or APXS instrument. Photo taken September 7, 2012.



"Rocknest" at upper left. Rock field is about 8 ft x 16 ft. taken on Sep. 28, 2012.



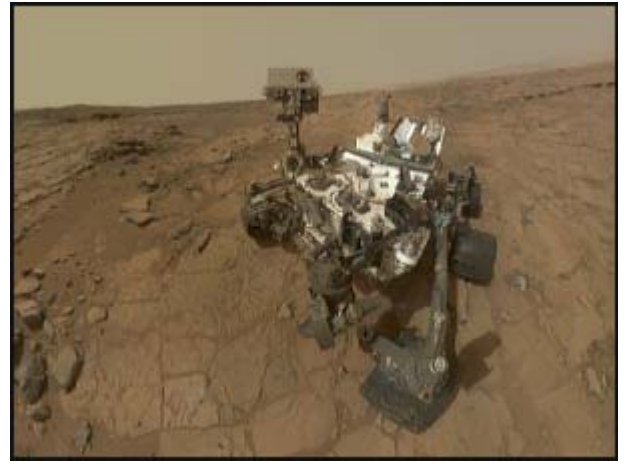
Transit of Phobos across the Sun. September 13, 2012.



Rocknest 3: one rock about 15 inches long. October 5, 2102.



A panoramic view from Rocknest, looking east towards the Point Lake area. Taken in November 2012.



Self portrait: Mosaic of dozens of photos taken with the MAHLI instrument. Photos arranged to keep the instrument arm out of the image.



Shaler outcrop near Glenelg. Area in foreground is about 3 ft. wide. Taken Dec. 7, 2012. It shows evidence of sedimentation made by flowing water.



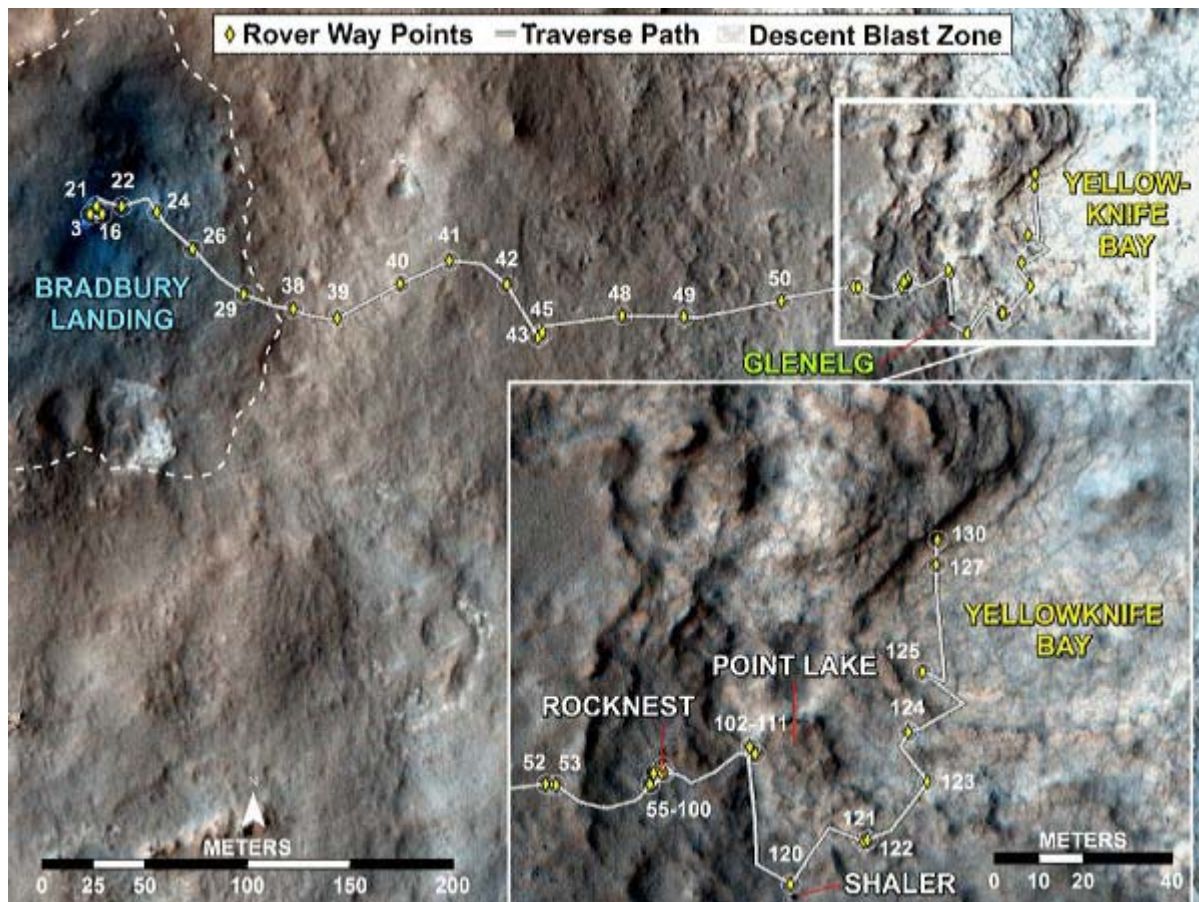
First test drill completed on Feb 6, 2013. Hole is 0.65 inches in diameter. It is interesting to note that the color of the rock powder is grey as opposed to the oxidized red color of the surface rock.

The image at right shows the first sample of powdered rock extracted by the rover's drill. The image was taken after the sample was transferred from the drill to the rover's scoop. In planned subsequent steps, the sample will be sieved, and portions of it delivered to the Chemistry and Mineralogy instrument and the Sample Analysis at Mars instrument. The scoop is 1.8 inches (4.5 centimeters) wide.

The image was obtained by Curiosity's Mast Camera on Feb. 20, or Sol 193, Curiosity's 193rd Martian day of operations. The image has been white-balanced to show what the sample would look like if it were on Earth.

Image credit all photos: NASA/JPL-Caltech/MSSS





The map above traces where NASA's Mars rover Curiosity drove between landing at a site subsequently named "Bradbury Landing," and the position reached during the mission's 130th Martian day, or sol, (Dec. 17, 2012). The inset shows the legs of the traverse in greater detail.

The rover entered a shallow depression called "Yellowknife Bay" with a drive of about 86 feet (26.1 meters) on Sol 125 (Dec. 12). It subsequently drove about 108 feet (32.8 meters) on Sol 127 (Dec. 14) and about 18 feet (5.6 meters) on Sol 130.

Yellowknife Bay was the location selected of the first target rock for Curiosity's hammering drill. The ground in this basin is a different type of terrain from the terrain Curiosity crossed getting there from Bradbury Landing. Nighttime observations from orbit indicate that the ground in the basin retains daytime heating better than the terrain around Bradbury Landing does, a property called high thermal inertia. The mapped area is within Gale Crater and north of the mountain called Mount Sharp in the middle of the crater. After the first use of the drill, the rover's main science destination will be on the lower reaches of Mount Sharp.

The rover's drill was in action on Feb. 8, 2013, or Sol 182, Curiosity's 182nd Martian day of operations. This was the first use of the drill for rock sample collection. The target was a rock called "John Klein," in the Yellowknife Bay region of Gale Crater on Mars.

Two compact laboratories inside NASA's Mars rover Curiosity have ingested portions of the first sample of rock powder ever collected from the interior of a rock on Mars. Curiosity science team members will use the laboratories to analyze the rock powder in the coming days and weeks.

The rover's Chemistry and Mineralogy (CheMin) and Sample Analysis at Mars (SAM) instruments received portions of the sample on Friday and Saturday, Feb. 22 and 23, respectively, and began inspecting the powder.

"Data from the instruments have confirmed the deliveries," said Curiosity Mission Manager Jennifer Trosper of NASA's Jet Propulsion Laboratory, Pasadena, Calif. The powder comes from Curiosity drilling into rock target "John Klein" on Feb. 8. One or more additional portions from the same initial sample may be delivered to the instruments as analysis proceeds.

The base image of this map is from the High Resolution Imaging Science Experiment Camera (HiRISE) in NASA's Mars Reconnaissance Orbiter. Text is from NASA/JPL Curiosity website.