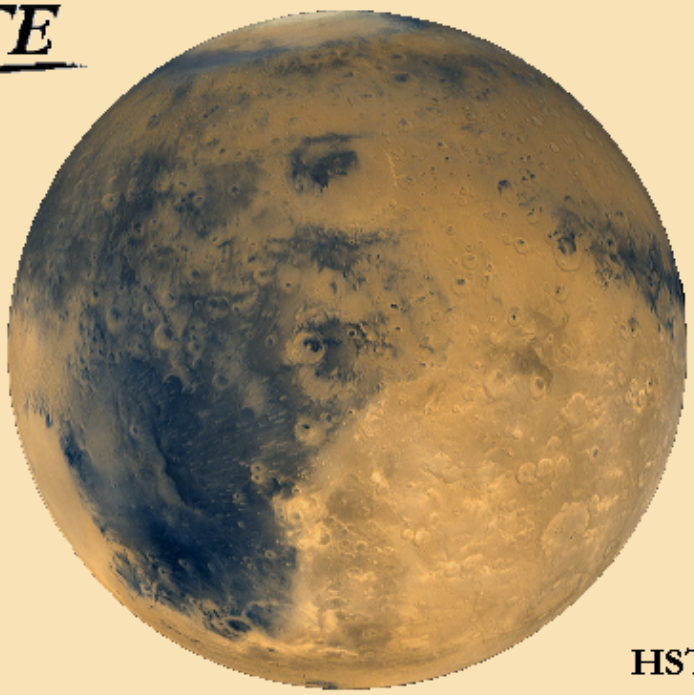
THE METEORITE



MARS

Syrtis Major Region

(South is up)

HST

Newsletter of the Mahoning Valley Astronomical Society, Inc.

IN THIS ISSUE:

FEBRUARY 2012

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

THE METEORITE

Newsletter of the Mahoning Valley Astronomical Society, Inc.

FEBRUARY 2012

MVAS CALENDAR

FEB 25	Business meeting at YSU. 8:00 PM Show.
MAR 24	Binocular Marathon at the MVCO. Sunset 7:41.
MAR 31	Business meeting at YSU. 8:00 PM Show.
APR 21	First Chili-Quest at the MVCO. Chili cook-off with a Galaxy Quest to follow. Sunset at 8:11 PM.
APR 28	Business meeting at the MVCO. 8:00 PM

NATIONAL & REGIONAL EVENTS

MAR 21 - 25 **Hodges Gardens Star Party**. Held at Hodges Gardens State Park, 1000 Hodges Loop Florien, LA 71429. $10.00 per adult, free for 18 and under. Plus $1.00 per day State Park Entrance fee. Free to camp on observing field or $12.00 per night to camp in State Park designated campground. This the Annual star party hosted by the Baton Rouge Astronomical Society. http://www.brastro.org/hgsp.html

MAR 22 - 25 **Georgia Sky View.** To be held at Camp McIntosh/Indian Springs State Park, 678 Lake Clark Rd. Flovilla, GA 30216 Admission Fee is $60 per person. This includes all fees except Georgia parking pass. The Georgia Sky View is an annual star party thrown by the Flint River Astronomy Club. There will be speakers, door prizes, and a pot luck dinner. http://www.flintriverastronomy.org/GSV2012.htm

MVAS, P.O. BOX 564 NEWTON FALLS, OH 44444-9998

MVAS Homepage- http://mvobservatory.com

NEWS NOTES

Pluto's Rings? Planetary Science Institute senior scientist Henry Throop and associates have used data from the four-meter Anglo-Australian Telescope in Australia to search for signs that Pluto may have rings orbiting it- Just like Jupiter, Saturn, Uranus and Neptune. Pluto's rings would be too faint and too small to see directly from Earth based telescopes. But occasionally, Pluto occults a star. By studying the resulting occultation light curve that was recorded, one could define the system in great detail. As Pluto or any ring passes in front of the star, the starlight blinks out, revealing its size and shape. Throop's team searched through several observations to try and find any hint of occulting rings of Pluto. So far, they haven't found any rings. But Throop will keep looking. He is working with NASA's New Horizons mission, which is sending a spacecraft to Pluto, to arrive in 2015. When it passes by Pluto, one of New Horizons' goals will be to conduct a search for rings, at much greater sensitivities than can be done from the Earth.

Throop's current search will actually help plan the encounter in 2015. "Rings are made of tiny dust grains, and we want to be sure that New Horizons will not collide with anything at Pluto," he said. "By knowing where there aren't rings, we help assure a safe path where the spacecraft will fly." Studying worlds like Pluto can teach astrobiologists about how dwarf planets form and evolve. This information can help us determine the types of planets that could exist in the Universe. Some research suggests that deposits of primordial organic matter might lie on Pluto's surface - and liquid water may exist a hundred miles below ground. *-by Staff Writers, Space Daily, Jan 24, 2012*

What a Blast. Astronomers combined observations from the ESO-operated 12-meter Atacama Pathfinder Experiment telescope with measurements made with ESO's Very Large Telescope, NASA's Spitzer Space Telescope, and others. They looked at the way bright, distant galaxies gathered together in groups or clusters. The more closely the galaxies are clustered, the more massive are their halos of dark matter - the invisible material that makes up the vast majority of a galaxy's mass. The new results are the most accurate clustering measurements ever made for this type of galaxy.

These galaxies are about ten billion light years away. We see them 10 billion years ago as they were undergoing the most intense type of star formation known, called a starburst. The starburst phase only lasts about 100 million years. But studies of how the dark matter halos grew over time showed that distant starburst galaxies from the early cosmos would eventually become giant elliptical galaxies; the most massive galaxies in today's Universe. They also found the halo/galaxy clustering matched those of black hole powered quasars. This could explain why massive elliptical galaxies stopped making stars long ago. The starburst activity sends a rush of matter into the black hole. As this matter is devoured, powerful outbursts of quasar energy ensue. This blast of quasar energy then "blows-away" most of the remaining star forming gas clouds in the galaxy. This effectively eliminates the source of star forming material and shuts down the star forming process.

-by Staff Writers, Munich, Germany (Space Daily) Jan 30, 2012

MINUTES OF THE JANUARY MEETING

JANUARY 28, 2012 at YSU

The first MVAS meeting of 2012 was held after the planetarium show "What Are Constellation?". Sharon Shanks spoke about the study of light, while passing out laser pointers to audience members. She explained how constellations came to be, using a few of the constellations as projected on the dome as examples. Following this was a program written and narrated by YSU's own Curt Spivey. It explored the historical details, explaining how Arabic, Greek and Latin names became commingled on today's charts. A lively scouting troupe had many questions. All in all, a very informative show.

The meeting was called to order at 9:26 PM. President Sam DiRocco presided. Roll Call had 21 members give the Password (name an asteroid). Guests included Virginia and Steven Bartos, Lisa and Zach Blevin, Dominic and Nicolas Mattuissi, Chuck and Debbie Iliff and their two grandchildren. Chuck and Debbie were former members and wished to rejoin the MVAS. They recently moved back to the area. There was a Call for the Reading of the Minutes. Bob Danko moved to suspend the reading and accept them as published. Dan Schneider seconded the motion. With no questions, corrections or further discussion the motion passed by a unanimous voice vote.

TREASURER'S REPORT: The Report was read by Steve Bartos. Larry Plante moved to accept the report as read. Bob Danko seconded the motion. With no further discussion the motion passed by unanimous voice vote. The Report follows:

General Fund	**12/1 thru 12/31 2011**	
OPENING BALANCE:	$	6,122.41
CLOSING BALANCE:	$	7,326.87
AVAILABLE FUNDS (NON-RESERVED):	$	3,162.75
ACCOUNT NET GAIN/LOSS FOR THIS PERIOD:	$	+1,204.46
INCOME:		
DUES	$	640.00
CHRISTMAS DINNER		340.00
RASC HANDBOOKS (2012)		125.00
ASTRONOMY CALENDARS (2012)		90.00
MVAS CLOTHING MERCHANDISE		20.00
DONATION BY ALLEN HEASLEY		100.00
DONATION BY THE ASTRONOMY CLUB OF AKRON		20.00
INTEREST		0.28
TOTAL INCOME	$	1,335.28
EXPENSES:		
CK# 2771 PROPANE	$	30.82
2772 CHRISTMAS PARTY RESERVATION (12-08-12)		100.00
TOTAL EXPENSES	$	132.82
Reserved Funds		
KEY DEPOSITS (MVCO)	$	250.00
CASH FROM ORIGINAL OAD FUND (FOR LAND)		3,914.12
TOTAL RESERVED FUNDS	**$**	**4,164.12**

2012 MVAS dues paid by and reported, in this period:

Baker, Bartos, Burdette, Chomos, Danko, Dimoff, DiNardo, Harker, Janeco, Keeley, Marko, Mehle, Miyashita, Pandian, P. Plante, Shanks. Thank you one and all!

CORRESPONDENCE: Bob reported no mail found at the P.O. Box. He has renewed the box for six more months. Bob will cover the expense out of pocket, as a donation to the MVAS. Sam received a thank you card from the Mattuissi family regarding the MVAS donation to Hospice of the Valley in the name of his late father, Armando Mattiussi. Steve received an invitation from Mr. Anthony's to have MVAS participate in a fundraiser for Hospice. This would be held during the Mardi Gras at Mr. Anthony's in February 2012. The fee for participation seemed high and thus no action was taken.

COMMITTEE/OFFICER REPORTS: *IMAGING COMMITTEE: VISUAL COMMITTEE: LIBRARIAN:* No reports given.

OBSERVATORY DIRECTOR'S REPORT: Larry Plante has not had a chance to visit the MVCO this year. Bob Danko was there earlier in the week and everything seemed in good shape. The water level in the out house seemed normal. Bob thinks the concrete that Mike Sprague put down inside the bend in the drive might be diverting much of the water away from the out house. Phil noted he didn't recall seeing if the building drains had been extended out past the fill dirt used to level the bank down to the lower parking area. This was confirmed as done.

OLD BUSINESS: Phil reported that the Telescope Seminar at YSU on January 14 was a success. Thirty people and eleven scopes arrived. Sharon coordinated workflow and kept track of things. Larry, Steve and Phil helped tune-up scopes and give advice on how to use them and what to do next. Phil also reminded the membership that we have a Binocular Marathon on March 24th. at the MVCO. He noted that Jupiter, Venus and Comet Garradd will be interesting binocular targets that night. We have one more meeting before then to plan for things like hot drinks and chow. Propane tanks are full, ready for use.

It was noted that we have already reserved the Stambaugh Room in Boardman Park for a Dec. 8, 2012 Christmas Party. The back-up date of Dec. 15th was already booked. It was good to act as quickly as we did. Steve still had 7 RASC Handbooks ($25 each) and a one Astronomy Calendar ($10 each). He can order more calendars if needed. See Steve about calendars.

NEW BUSINESS: Sam DiRocco had the Trustee positions to handle. Only Rosemary was interested for the Appointed position. She had just completed the last few months of Bill Peace's term. With no opposition, she will continue as an Appointed Trustee; for a 2 year term. Dan Schneider has finished his 1 year term as Elected Trustee. He was the only member interested in this position. The general membership elects this Trustee as their representative to the Board. The membership voted for Dan (unanimous consent) as the Elected Trustee, for another 1 year term.

The president then re-appointed the other two officers: Larry Plante as *Observatory Director* and Rosemary Chomos as *Librarian*. Phil Plante was appointed to continue as *Meteorite Editor*. Dave Ruck will continue as Assistant O.D. and Steve Bartos will continue as Assistant Editor. There was a suggestion by the editor that we might consider going totally PDF with the *Meteorite* and eliminate paper editions at some point down the road. Many other organizations are in this mode already. It would save the MVAS over $300 per year in postage and printing costs and give the publication team a break (Virginia). About 21 members out of 58 get paper copies right now. We are flexible. Might be something to consider for next year…?

GOOD OF THE SOCIETY: Rich Mattuissi had five hardcover books to donate to the Terry Biltz Library (MVCO). These were salvaged from a library purge at Cardinal Mooney High School. We thank Rich for these thoughtful donations: *Out of the Darkness: The Planet Pluto*; *And there was Light -the Discovery of the Universe*; *Getting Acquainted with Comets*; *Comets*; *Space Science and Astronomy: Escape from Earth.* Almost

forgot, but a vote on renewing the Iliff's membership was taken. It was a unanimous decision in favor of membership. Debbie had left her job of 13 years at the Ashtabula County Health Department and has now moved to Sharon, PA. Being closer, they hope to be more involved in MVAS activities tried. They once tried to start an astronomy club in Ashtabula County. They had done a number of star parties on the Western Reserve Greenway. Welcome back!

VISUAL REPORTS: Dan Schneider reported very dark skies in Boardman just before the meeting. There was a power outage at that time, ending the usual light pollution. Phil Plante had 12 variable star estimates. Addendum: Chris Stephan sent an e-mail report that he had one session in January, getting 80 variable estimates on 3 eclipsers and one binocular variable.

ADJOURNMENT: Adjournment came at 9:54 PM. We thank our hosts Steve Bartos, Larry and Phil Plante. The meatball sandwiches were awesome. The Mocha House cheesecakes were yummy as always. The next meeting will be at YSU on February 25, 2012. Meeting begins after the 8:00 PM show called "Oasis in Space". Scheduled host is Mark Baker. PASSWORD: Name a feature on Mars. *-minutes by Phil Plante*

A Special Thanks . . . .

The MVAS extends its deepest gratitude to Dr. Warren Young for his $200 donation and to Mr. Allen Heasley for his $100 donation. These were given over the Holiday break. The MVAS membership appreciates the support that these fine gentlemen have shown over the years.

MVAS REMINDERS

As always, please get your 2012 membership dues in to the Treasurer. It is $40 per year for an adult. Family membership is an additional $10 per year for each member of a household that wishes membership. A single Junior membership is available for $10 per year (for 16 years or younger). Your dues are needed this year to cover spouting repairs to the 16" building. Let's keep the place going for another 50 years…..

This September 29th is the 50th Anniversary of the dedication of the 16" Building (MVO) in 1962, by then Ohio Governor Michael DiSalle. Checking the schedule, our September meeting is on the 29th this year. That is the anniversary date! We have time to consider special plans for that meeting, if any. It's a full moon weekend, so a star party will be limited. Get your thinking caps on!

We are reminded that there is a first ever Binocular Marathon on March 24, 2012 to be held at the MVCO. This is a "replacement" event for the long running Messier Marathon we've had since the mid-90's. March evenings can be mild or down-right freezing. So dress accordingly. Wear winter boots and a hat even if it's mild. Keep an extra hoodie or flannel shirt in the car in case you get cold. If we luck out with clear skies, bring your binoculars. The idea is that binoculars are the ideal instrument to use on cold nights. Nothing to set up except a lawn chair or anti-gravity chair. You can quickly duck indoors to warm-up and de-fog the optics if needed. A small grab-n-go scope is acceptable if you don't have binoculars. If it's really clear, we might even have one of the MVCO scopes running. We can only hope- we are due for a good night.

Listed below are some binocular sights for the Marathon. Breaking from tradition, we stray a little from just a list of Messier objects. This list could guide you during the early evening, "Moon-free" periods of February 17 to 25, March 16 to 27 and possibly April 14 to 25. Solar system objects are subject to changing visibility as they shift positions in the sky.

For March 24, 2012 at MVCO: (Sunset 7:41pm EDT.)

1) 8:30pm **5% crescent Moon** in MVCO trees, due west. Look for Earthshine. (at end of nautical twilight).

2) 8:30pm **Jupiter** is 4° above tree line at MVCO, due west. Look for moons- how many can you detect.

3) 8:30pm **Venus** 13° above MVCO tree line, due west. Look for a half-phase. Venus will appear 2.5 times larger as a round disk during the June 5 Transit. Evaluate the likelihood of a good view of the Transit using your binoculars (with proper solar filters); especially if this was your main plan. Compare the size of Venus tonight to determine if this works for you. If you can make out the phase of Venus you might be ok with your binoculars.

4) 9:30pm **Pleiades** 33° up, due west. Swing to NW for the following: M34, α Persei Association, Double Cluster, NGC 457 (Owl Cluster in Cassiopeia)

5) 9:30pm From Pleiades, swing to SW for: Hyades, Orion's Belt, M42 region, Sirius, M41, M50, M47, M46.

6) 10:00pm **Capella** 52° up, just north of West. From Capella, sweep left to nab M38, M36, M37, and M35.

7) 10:00pm **α U Ma (Dubhe)** 61° up in the Northern sky. As a reference, sweep to the lower left to find **Comet Garradd**. Continue sweeping from the Comet to catch galaxies M81 and M82.

8)10:00pm Other binocular objects include M44, M67, Coma Berenices (O. Cluster. Melotte 111), Mars, & variable star R Leo.

These are just suggested targets- observe what you like/can. We'll reserve the Virgo galaxies for the Galaxy Quest in April.

MVAS ACTIVITIES

On January 14, the YSU Planetarium hosted its third "So You Got a Telescope" seminar. The idea is to have people bring in their new telescope to learn how to use them. Sharon Shanks acted as coordinator, while members Larry, Steve and Phil checked-out the scopes. Phil's laser collimator came in handy. Some scopes just needed minor tweaking. Most folks had to learn which eyepieces to use, while others had to be trained how to focus. The poor quality of some scopes was frightening. A few were decent enough, but some needed to be put out of misery by sledge hammer, but of course we couldn't do that. In all 30 people attended, bringing 11 telescopes. It was most encouraging to see that many kids interested in astronomy. I only hope the bad telescopes won't dampen their enthusiasm. Thanks to Sharon for the sodas and cookies.

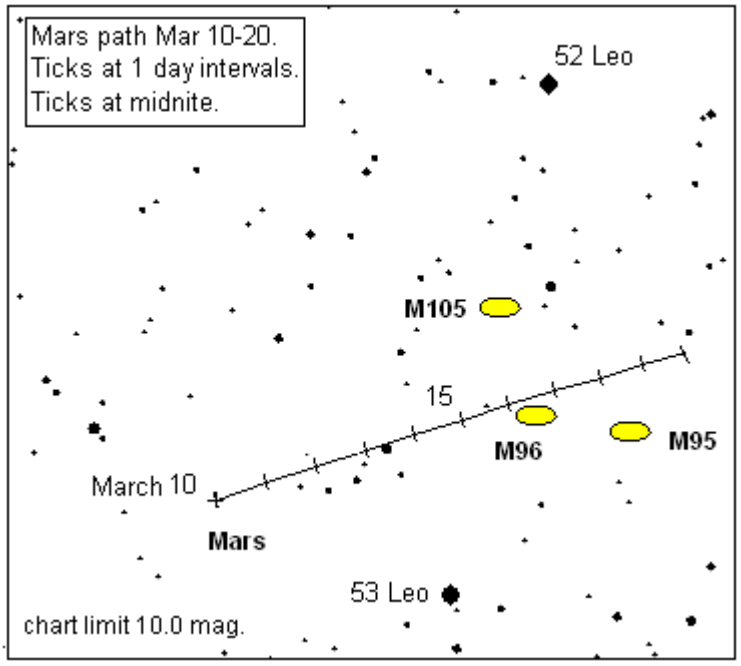
In 2011, the AAVSO stopped accepting visual observations of eclipsing variable stars. This is Chris Stephan's main area of vso's. Thus he turned to the Variable Star Observer's League of Japan as they accepted his observations. They were published in their *Variable Star Bulletin* on January 20, 2012. He now has a place to have his work utilized and published. Good going Chris. We have an international astronomer in our ranks!

Observer's Notes.....

A MESSIER MARTIAN FLYBY

Mars passed through opposition on March 3rd which means it rises earlier in the evening sky each night. Right now it's at its brightest and largest appearance - for this apparition. About a week after opposition, Mars starts a run past some Messier galaxies in Leo- namely M-95, M96 and M105. Beginning March 15-19th, Mars is closest to the group of galaxies. This affords a unique opportunity to let Mars pinpoint the location of these galaxies. If you don't have a Go To mount this is a good thing. But Mars will be bright and its glare may be a problem. You'll have to keep Mars out of the field of view. Easy to do when using a scope with a half degree true field of view.

Mars will be around 32 arcminutes east of M96 on March 15. A rising last quarter moon will likely interfere around 12:00 AM on the 15th. Less-so in coming nights. From the 16-17th we'll see Mars within 12 minutes of M96 (passing north, E-W). California observers can catch Mars 8 minutes NE of M96 on March 16th- at 4 AM PDT. Closest approach is around 2:00 PM EDT. North Americans miss this. On March 18th at 5:00 AM EDT, Mars will make its closest approach to M95 -for Eastern Time Zone observers. It will be about 25 deg up in the western sky. Use the chart below for a guide. Let's see if Mars was too bright, blocking-out the faint galaxies. Could you visually see all three galaxies and Mars at once in an RFT scope? Tell us what equipment you used. Imagers have a challenge here. Maybe a wide field with Mars and three galaxies in the same frame?



MVAS Homework:

Mars and Syrtis Major.

One of the biggest complaints about observing Mars is that you can't see anything on it. But this stems from not using enough magnification and looking at the wrong time. Sometimes you look when the vast desert area is presented (Amazonis). Experienced observers can search for orographic clouds on the Tharsis volcanoes. Casual observers will need to look for one of the more easily recognized albedo features: namely Syrtis Major. It has a shape reminiscent of the border outline of India or the continent of Africa. Listed below are the times for the Eastern Time zone, when Syrtis Major is on the central meridian of Mars (CM). The Martian CM longitude of 280° was used in the calculations. The EDT of CM transits is given in column 3. The given Universal Time (UTC) should allow others in different time zones find their best opportunities.

In general, Syrtis Major should have a good appearance for up to 2 hours before or after the CM times below, as Mars' altitude permits (sets or rising). Optimum viewing and imaging occurs when Mars is due south and highest in the sky. For Syrtis Major this occurs March 8-10 around 12AM and April 13-15 around 10PM. Abbreviations under the Condition Column have: **N=** nautical twilite, **A=** astronomical twilite, **C=** civil twilight, **m=** moon up. Mars starts off March at 13.8" in diameter and is down to 10.7" by the end of April. Take your best shot these two months. Lets see some sketches and images!

Syrtis Major CM Transit Times: March and April 2012

DATE	UTC	Eastern	Cond.	Azimuth	Altitude
Feb-29	00:03	7:03 EST	Nm	82.7°	6.5°
Mar-01	00:39	7:39	Am	89.4	14.3
Mar-02	01:15	8:15	m	96.2	22.2
Mar-03	01:51	8:51	m	103.6	30.0
Mar-04	02:27	9:27	m	112.0	37.6
Mar-05	03:03	10:03	m	121.8	44.6
Mar-06	03:39	10:39	m	133.8	50.9
Mar-07	04:15	11:15	m	148.9	56.0
Mar-08	04:51	11:51	m	167.1	59.0
Mar-09	05:27	12:27	m	187.1	59.5
Mar-10	06:03	1:03	m	206.3	57.4
Mar-11	06:39	1:39	m	222.6	53.1
Mar-12	07:15	3:15 EDT	m	235.7	47.3
Mar-13	07:51	3:51	m	246.3	40.5
Mar-14	08:27	4:27	m	255.2	33.2
Mar-15	09:03	5:03	m	263.0	25.7
Mar-16	09:39	5:39	m	270.1	18.0
Mar-17	10:15	6:15	Am	276.9	10.3

March 18 to April 9: Mars elevation is below 3° or Mars is up in daylight, when Syrtis Major is on Mars' CM.

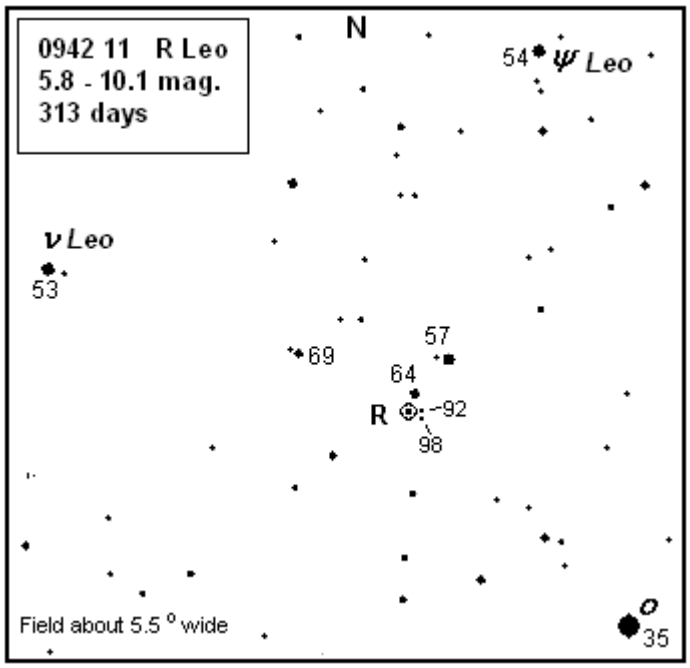
Apr-10	00:03	8:03 EDT	C	119.2	46.2
Apr-11	00:39	8:39	N	131.0	52.4
Apr-12	01:15	9:15	A	145.7	57.4
Apr-13	01:51	9:51		163.8	60.6
Apr-14	02:27	10:27		184.0	61.4
Apr-15	03:03	11:03		203.6	59.5
Apr-16	03:39	11:39		220.2	55.5
Apr-17	04:15	12:15		233.5	49.9
Apr-18	04:51	12:51		244.2	43.5
Apr-19	05:27	1:27		253.0	36.4
Apr-20	06:03	2:03		260.6	29.1
Apr-21	06:39	2:39		267.5	21.6
Apr-22	07:15	3:15		274.0	14.1
Apr-23	07:51	3:51		280.3	6.6

Mars elevation drops below 3° when Syrtis Major is on CM.

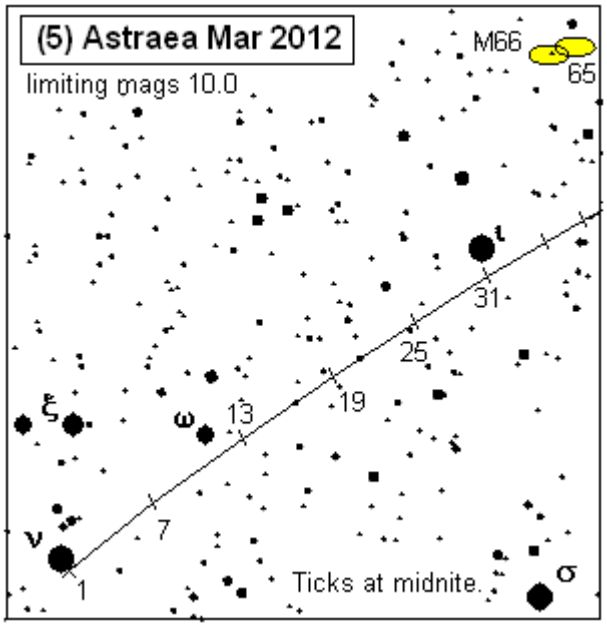
Data generated from JPL Horizons computations.

MVAS OBSERVER CHARTS

Variable star of the month: **R Leonis** (*abbrev:* R Leo). This is a nice variable to follow as it brightens towards a predicted March 26th maximum at 5.8 magnitude. It can be a bit brighter or a bit dimmer at max. But getting this bright means you could even use binoculars. This is a great first variable. Give it a try.



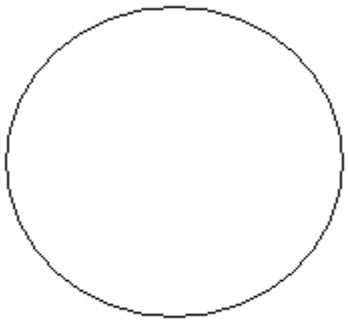
Asteroid of the month: **(5) Astraea.** In March, we continue watching this asteroid (see the February chart in the January *Meteorite*). It moves into Leo, brightening from 9.3 magnitude on the 1st to a peak of 9.1 on the 13th. Then it drops to 9.6 mag. by the 31st. By then it is just south of iota Leo and M65/66 is farther north. A small scope will work better than binoculars. Use iota to locate M65/66 while in the area.



MVAS OBSERVATIONS - DUE MARCH 2012

OBSERVER_____

Featured object: Mars. Please try a sketch. Use the circle below as the outline of Mars. First, draw-in a curved line depicting the terminator's edge due to a gibbous phase (if any). Then blacken the part that is in shadow. Draw a curved outline for any polar cap. Shade in as needed, both cap and desert areas. Note: at opposition, Mars appears round with no phase. Use the highest powers that the seeing will allow.



Mars Observation:

Date:_____ Time(EDT)_____ Scope_____

R Leo magnitude estimates:

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

(5) Astraea Observations:

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

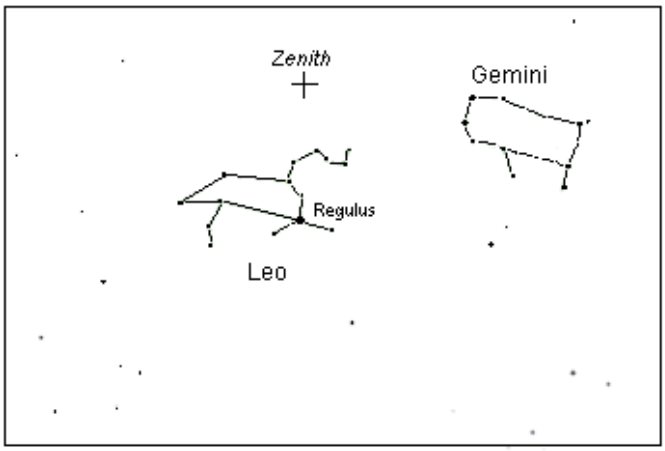
Other Objects in Leo to observe

D. Sky	Date	Scope	**Dbl.**	Date	Scope	SEP	MAG	SPLIT?
M- 65	_____	_____	γ Leo	_____	____	4.6"	2.4 - 3.6	Y / N
M- 66	_____	_____	δ Leo	_____	____	204"	2.6 - 8.6	Y / N
M- 105	_____	_____	54 Leo	_____	____	6.3"	4.5 - 6.3	Y / N

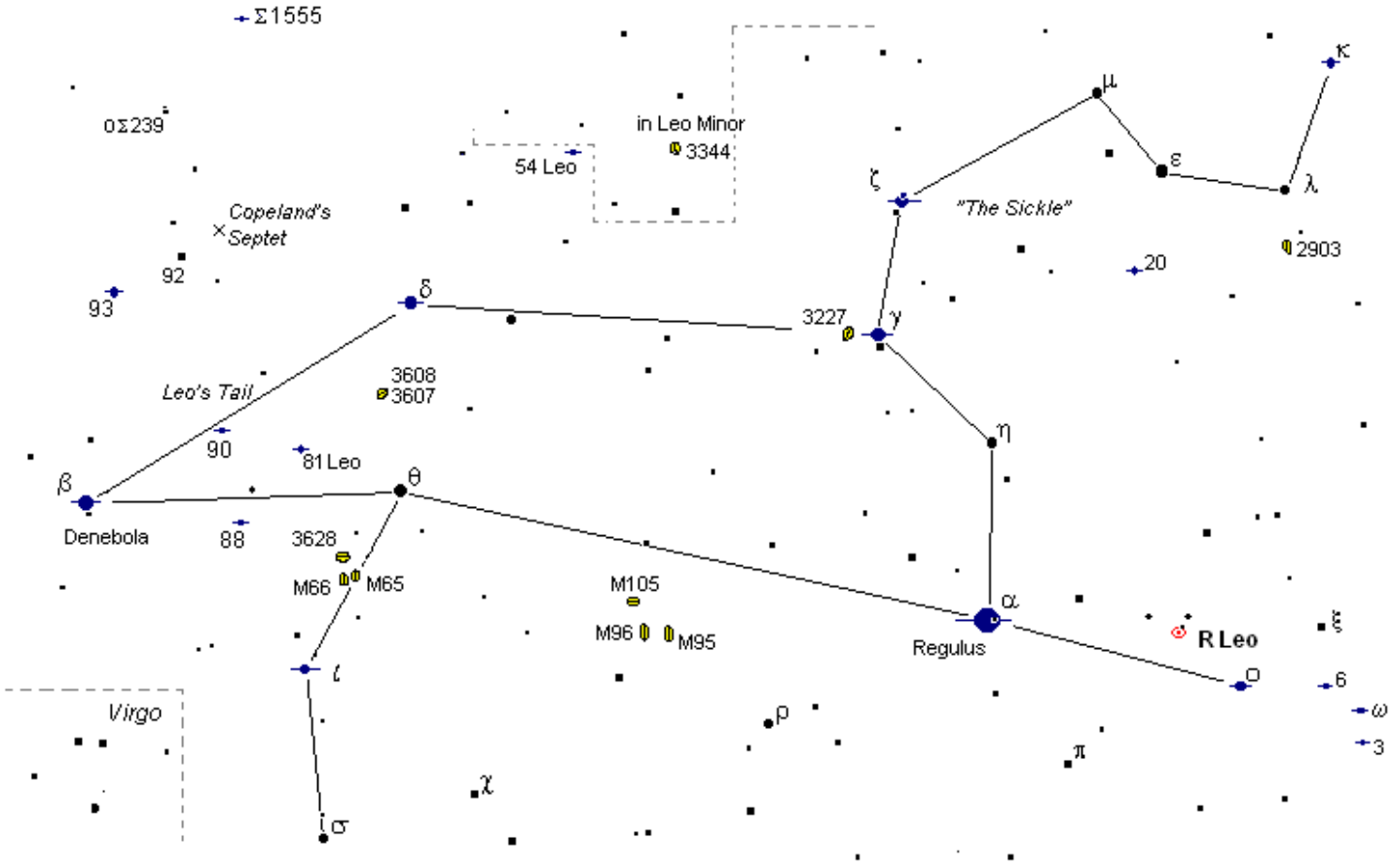
Lunar Occultations (see Sky Almanac):

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

Constellation of the Month — Leo



March is the first month to use Daylight Saving Time which means the sky will darken an hour later than in February. To find Leo at mid month, go out around 11pm and look straight up. The point exactly overhead is called the Zenith. Face south and look down from the Zenith a bit until you see the bright star called Regulus. From there you should try to trace-out a backwards question mark above and including Regulus. This is supposed to be the head or mane of the Lion. It's sometimes called "The Sickle". The tail quarters of Leo are to the left, formed by a triangle of stars. Double stars and galaxies are offered to us this month. A 3 or 4 inch instrument might pick up a few of the galaxies. The double stars listed below should be easy going as well. Check the variable R Leonis a few times and watch it change brightness. Make an estimate with the chart supplied. Remember to check off your successes and record your magnitude estimate of R Leo. The MVAS looks forward to receiving your report.



DEEP SKY	ALL GALAXIES		
M65	10.3 mag.	6' x 2'	SB 12.8
M66	9.7 mag.	6' x 3'	SB 11.9
M95	10.5 mag.	5' x 3'	SB 12.7
M96	10.1 mag.	5' x 3'	SB 12.5
M105	10.2 mag.	3' x 3'	SB 11.3
N3227	10.3 mag.	3' x 3'	SB 13.7
N3607	9.9 mag.	4' x 3'	SB - - -
N3628	10.3 mag.	10' x 2'	SB - - -

Copeland's Septet – 7 galaxies at 13.2 to 15.2 magnitude. 6' dia. fld.

Doubles:	mag.		sep.	"colors"
ι Leo	4.1	6.7	1.7"	yellow-white
δ Leo	2.6	8.6	204"	yellow-silver
κ Leo	4.5	9.7	2.4"	yellow-blue
γ Leo	2.4	3.6	4.6"	gold-greenish
α Leo	1.4	8.2	176"	white-purple
54 Leo	4.5	6.3	6.3"	yellow-saphire
81 Leo	5.6	10.8	55"	yellow-red
0Σ239	6.0	10.2	37"	optical dbl.

Variable Star:
R Leo 4.4 - 11.3 mag. 309 day period

Check list

___ M65
___ M66
___ M95
___ M96
___ M105
___ N3227
___ N3344
___ N3607
___ N3628
___ Copeland
___ ι Leo
___ δ Leo
___ κ Leo
___ γ Leo
___ α Leo
___ 54 Leo
___ 81 Leo

Instrument used — date

_____ on _____
_____ on _____
_____ on _____
_____ on _____

R Leo ___ mag on ___/___/___
R Leo ___ mag. on ___/___/___

2012 MARCH SKY ALMANAC

Solar and Lunar (EDT).

Date	Sunset		Moonrise		Moonset	
1	6 : 15		11 : 32a		1 : 58a	
5	6 : 20		3 : 35p		4 : 51	
9	6 : 24		8 : 24		7 : 01	
13	7 : 29	EDT	1 : 03a	EDT	10 : 47	EDT
17	7 : 33		4 : 35		2 : 54p	
21	7 : 38		6 : 36		7 : 04	
25	7 : 42		8 : 28		10 : 59	
29	7 : 46		11 : 16		1 : 40a	

PLANET WATCH

	Venus	Mars	Saturn
	Sets	*Transits*	*Transits*
	10:02p	12:56a	3:38a
	10:10p	12:35a	3:21a
	10:17p	12:13a	3:05a
	11:25p	12:48a	3:48a
	11:32p	12:30a	3:32a
	11:39p	12:10a	3:15a
	11:45p	11:44p	2:58a
	11:51p	11:25p	2:42a

March 2012

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

Asteroid for March 2012 (5)Astraea

Date	Rises		RA hr. min	Dec. deg.		Alt.	Azm	Magnitude
1	7 : 04 pm	EST	11 : 45	+06.4	EST	50°	143°	9.3
7	6 : 33 pm		11 : 41	+07.2		53	153	9.1
13	7 : 02 pm	EDT	11 : 36	+08.0	EDT	51	141	9.1
19	6 : 31 pm		11 : 31	+08.9		54	150	9.2
25	6 : 01 pm		11 : 37	+09.6		57	161	9.4
31	5 : 31 pm		11 : 23	+10.1		59	174	9.6
			(at midnight)			*(at midnight)*		

Variable Star of the Month: **R Leo** 5.8 - 10.1mag 310 day period

Celestial Highlights

Date	UT hr	
1	1.5	**FIRST QUARTER MOON**
3	20.7	Mars at opposition
5	9.5	Mercury greatest E. 18°
8	10	**FULL MOON**
11	18	Astraea at opposition
13	22.5	Venus 3 N. of Jupiter
15	1.5	**LAST QUARTER MOON**
22	14	**NEW MOON**
26	19	Venus 1.8° N. of Moon
27	7.5	Venus greatest E. 46°
28	00	R Leo maximum 5.8m
30	20	**FIRST QUARTER MOON**

LUNAR OCCULTATIONS FOR: MARCH 2012

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.
1	19	36	47	2	00	36	47		D	59+	70°	198°	114 TAU	4.9	049°	0.10"
2	1	33	31	2	06	33	31		D	61+	11	288	zeta TAU	3.0	159°	.007"
3	0	23	58	3	05	23	58		D	70+	32	269	nu GEM	4.1	140°	.031"
7	1	21	07	7	06	21	07		D	98+	47	223	ZC 1482	6.2	107°	0.10"
15	6	09	10	15	10	09	10	EDT	R	46-	22	155	ZC 2588	7.0	245°	NA
16	6	18	48	16	10	18	48		R	35-	20	144	xi SGR	5.0	269°	NA
16	6	31	35	16	10	31	35		R	35-	21	146	ZC 2760	6.9	324°	0.17"
24	20	43	48	25	00	43	48		D	5+	13	278	ZC 271	8.5	024°	23.0"
27	21	30	45	28	01	30	45		D	24+	34	269	53 TAU	5.5	055°	0.05"
27	23	03	15	28	03	03	15		D	25+	17	283	ZC 646	6.1	126°	1.90"
27	23	30	53	28	03	30	53		D	25+	12	287	ZC 651	6.0	083°	0.20"

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.....

Mars Up Close.

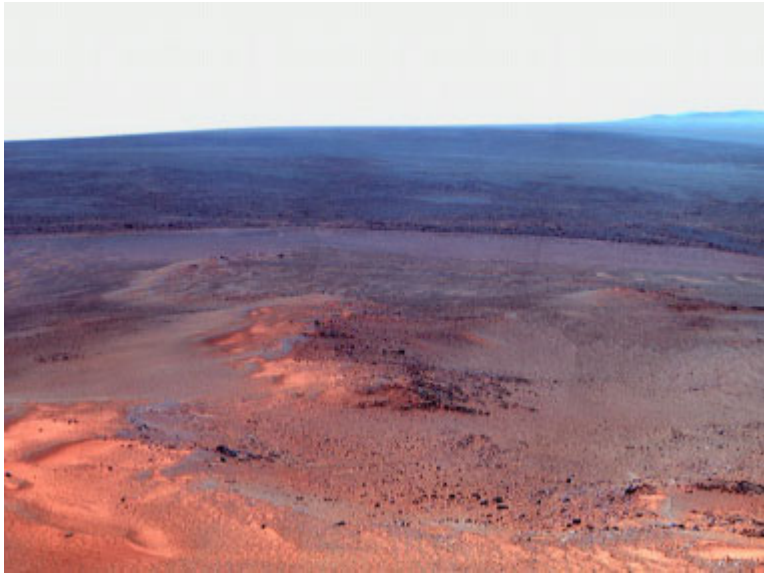


Image Credits: NASA/JPL/University of Arizona

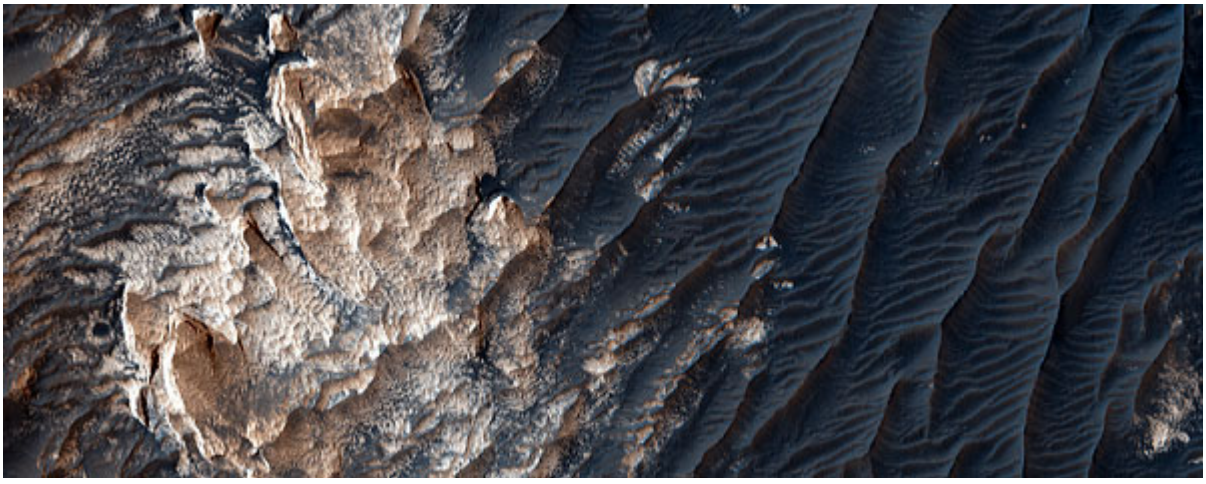
Opportunity's Eighth Anniversary View From 'Greeley Haven' (False Color)

This mosaic of images taken in mid-January 2012 shows the windswept vista northward (left) to northeastward (right) from the location where NASA's Mars Exploration Rover Opportunity is spending its fifth Martian winter, an outcrop informally named "Greeley Haven." Opportunity's Panoramic Camera (Pancam) took the component images as part of full-circle view being assembled from Greeley Haven. The view includes sand ripples and other wind-sculpted features in the foreground and mid-field. The northern edge of the the "Cape York" segment of the rim of Endeavour Crater forms an arc across the upper half of the scene. Opportunity landed on Mars on Jan. 25, 2004, Universal Time and EST (Jan. 24, PST). It has driven 21.4 miles (34.4 kilometers) as of its eighth anniversary on the planet. In late 2011, the rover team drove Opportunity up onto Greeley Haven to take advantage of the outcrop's sun-facing slope to boost output from the rover's dusty solar panels.

Approaching 'Greeley Haven' on Endeavour Rim

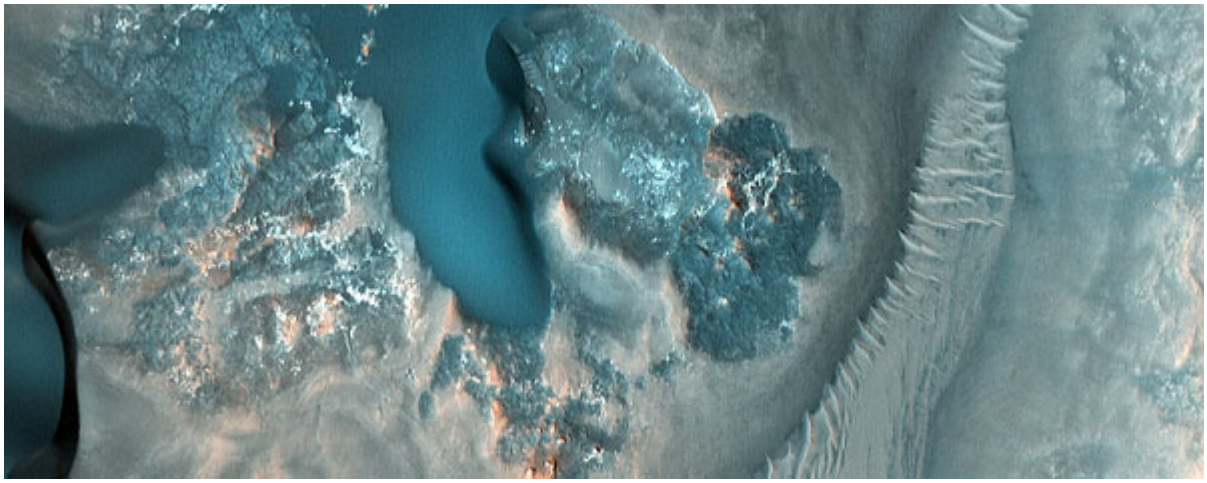
NASA's Mars Exploration Rover Opportunity used its navigation camera to capture this view of a northward-facing outcrop, "Greeley Haven," where the rover will work during its fifth Martian winter. The rover team chose this designation as a tribute to the influential planetary geologist Ronald Greeley (1939-2011), who was a member of the science team for the Mars rovers and many other interplanetary missions.

Greeley Haven provides a north-facing slope of 15 degrees or more to aid electric output from Opportunity's solar array. It also presents geological targets of interest for investigation during months of limited mobility while the rover stays on the slope. Opportunity took this southward-looking image during the 2,790th Martian day, or sol, of the rover's mission on Mars (Nov. 29, 2011), before an approach drive to the outcrop. The site is near the northern tip of the "Cape York" segment of the western rim of Endeavour Crater. Portions of the crater's interior and far rim are visible in the background. In the subsequent three weeks, Opportunity checked properties of two specific targets on the outcrop with tools on its robotic arm and tested maneuverability on the sloping surface. After deciding that the site could serve the mission well for the next several months, the team informally named it as a memorial for Greeley, who taught generations of planetary scientists at Arizona State University until his death on Oct. 27, 2011.



Aram Chaos. The Southern cap rock in Aram Chaos is situated in the Martian equatorial region, to the east of the Tharsis region. In Ancient Greek, "chaos" meant an emptiness or void, the gap that existed between the heavens and the earth; here, we use the word to describe terrain that is jumbled and "confused." As the

image shows us, Aram Chaos is actually a heavily eroded impact crater, with material on the floor that is blocky in contrast to some of the surrounding terrain. This would be an interesting area to explore and to send a rover, because we think that water might have existed in the underground as ice. This caption is based on the original science rationale. *MRO image*. Written by: HiRISE Science Team (11 January 2012)



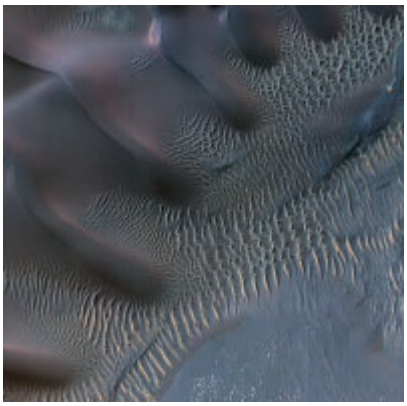
Active Erosion in Pasteur Crater (image below)

This image shows knobs and bluffs that are being actively eroded by the Martian wind. Fine, light-toned sedimentary layering is exposed in the bedrock at the base of the cliffs. Also in this scene are two types of unconsolidated aeolian sediments. The reddish ridges are relatively immobile, and are probably similar to granule ripples on Earth that are protected from the winds by a surface layer of coarse grains. The dark gray dunes are probably made up of fine (approximately 0.1 mm) basaltic sand. Previous HiRISE images SP_001756_1995, SP_010643_1995) showed that the sand in Pasteur Crater is currently mobile.

This sand is thought to be locally derived, from dark deposits within a small crater called Euphrates that is located within Pasteur, upwind of the sand dunes. The movement of this sand contributes to the erosion of the ancient bedrock, sandblasting the formation into the knobs seen today and exposing layers that were deposited in ages past. *MRO image.*
Written by: Paul Geissler (1 February 2012)

Crater with Gullies on a Central Structure (below left)

The 40-kilometer diameter unnamed crater (49 degrees North, 21 degrees East) in this image is located west of Lyot Crater and north of Deuteronilus Mensae in the Northern Plains of Mars. As seen in the subimage, gully systems in the central structure have eroded underlying layers (undercutting) that are less resistant to erosion than the surface rock of the central structure. Previous channelized water flows likely transported the eroded sediments toward the southeast and deposited them forming the expansive debris aprons. The formation of channels on the debris aprons supports the hypothesis that these sediments were transported down the gullies and then deposited onto the aprons by flowing water. In the larger, northernmost system, sediments have partially filled in the channel segments and winds have remobilized these sediments forming the dunes that line the gullies. *MRO imgage. Written by: Ginny Gulick (1 February 2012) Image Credits: NASA/JPL/University of Arizona*



Dunes in Noachis Terra Region of Mars. (left)

This enhanced-color image shows sand dunes trapped in an impact crater in Noachis Terra, Mars. Dunes and sand ripples of various shapes and sizes display the natural beauty created by physical processes. The area covered in the image is about six-tenths of a mile (1 kilometer) across. *MRO image.*

Image Credit: NASA/JPL- Caltech / University of Arizona .