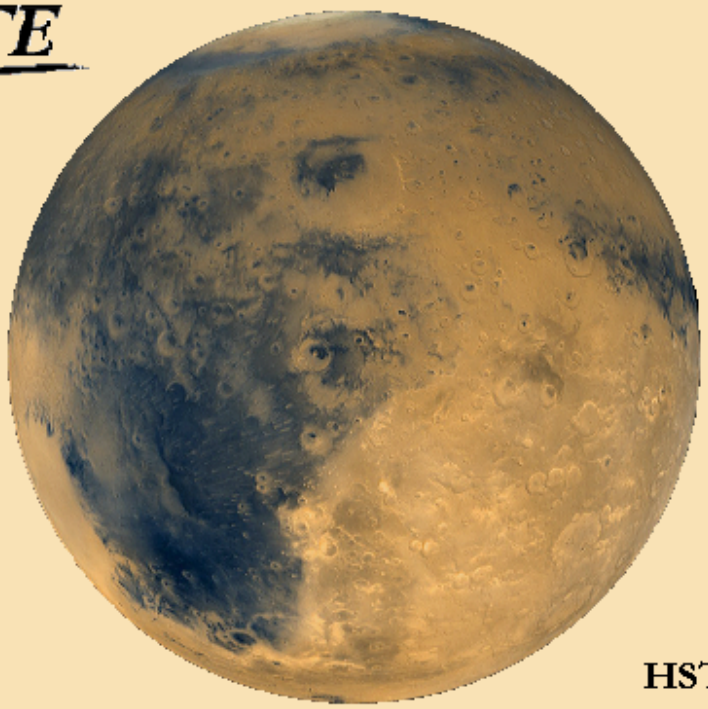
THE METEORITE



MARS

Syrtis Major Region

(South is up)

HST

Newsletter of the Mahoning Valley Astronomical Society, Inc.

IN THIS ISSUE:

JANUARY 2010

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

THE METEORITE

JANUARY 2010

Newsletter of the Mahoning Valley Astronomical Society, Inc.

MVAS CALENDAR

JAN 16	Public telescope training at YSU. 1:00 to 3:00PM
JAN 30	MVAS meeting at YSU. 8:00 PM.
FEB 27	MVAS meeting at YSU. 8:00 PM.
MAR 13	Messier Marathon at MVCO. At sunset

NATIONAL & REGIONAL EVENTS

FEB 8 - 13	Winter Star Party, Florida Keys
APR 24	International Astronomy Day
MAY 9-16	Texas Star Party, Fort Davis, TX

OTAA MEETINGS 2010 (so far)

MAY 15	OTAA Scenic Vista Stargaze (MVAS)
AUG 14	MVAS-OTAA Meeting at the MVCO

YSU WARD BEECHER PLANETARIUM

JAN 15/16	8:00 PM Skywatch
JAN 22/23	8:00 PM STARS
JAN 29/30	8:00 PM STARS
FEB Fri./Sat.	8:00 PM STARS

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

An MVAS Look Ahead 2010

AT YSU January 16: *So you got a telescope for Christmas*— Members of the MVAS and the planetarium staff will conduct this special class, training members of the public on how to use their telescopes (new or collecting dust) or maybe just answer their questions about them. It's an informal event with people coming anytime between 1 and 3 p.m. to meet with the experts. Be there if possible. There is always a prospect of "eats" afterward.

Tentative Schedule for MVAS in 2010

JAN	16	Telescope fair YSU
JAN	30	Meeting YSU 8:00PM
FEB	27	Meeting YSU 8:00PM
MAR	13	Messier Marathon MVCO (last night of EST)
MAR	27	Meeting YSU 8:00PM
APR	*4*	*Easter Sunday*
APR	10	Galaxy Quest MVCO (new moon on the 14th)
APR	17	Chili cook-off. 7:00 PM
APR	24	Meeting at MVCO. 8:00PM
MAY	**15**	**OTAA Scenic Vista Stargaze**
MAY	29	meeting MVCO
MAY	*31*	*Memorial Day*
JUN ??	12	CVAS? (new moon on 12th) possible date.
JUN	26	Meeting at MVCO. 8:00PM
JUL	4	on Sunday this year.
JUL ??	10	CAA (new moon on 11th) possible date.
JUL	17	MVAS at Scenic Vista (~1st qtr moon)
JUL	31	Meeting at MVCO. 8:00PM
AUG	**14**	**MVAS-OTAA at MVCO**
AUG	28	Meeting at MVCO. 8:00PM
SEP	*6*	*Labor Day*
SEP ??	11	BRAS? (new moon on 8th) possible date.
SEP	25	Meeting at MVCO. 8:00PM
OCT	2	MVAS at Scenic Vista
OCT	23	Meeting at MVCO. 8:00PM
OCT	30	Halloween Party MVCO. 7:00 PM
NOV	6	new moon Saturday open--anything?
NOV	20	Meeting YSU 8:00PM
NOV	*25*	*Thanksgiving*
DEC 4 or 11		Christmas Party (same place?)

Holidays are in *italics* and are included to let you see how they fit into yours and the MVAS schedule. The OTAA events for Chagrin, Cuyahoga and Black River are NOT yet set by these clubs. A likely (my guess) date has been included, based on the closest New Moon weekend, which has been standard practice over the years. There will be no Astronomy Day at YSU this year. Our two big OTAA events are in **bold** type and have been reserved. We will have only three Scenic Vista events, no back-up nights. We will also skip any events in Boardman or Austintown Parks for this year. Plan on several work weekends at the MVCO.

Prelude: At 7:00 PM, a most delicious meal was enjoyed at the Larricia Community Center in Boardman Park; site of the MVAS Annual meeting and Christmas Party. After the meal, pre-meeting activities began with a report from Don Durbin concerning the green laser pointers he has obtained from Burgess Optics. Many had pre-ordered these and the MVAS also purchased 10 units for future sale, but reserving several for use as OTAA door prizes. Don also told of various other products that may be available from Burgess at discount prices.

Don next told of the 42" HD TV monitor he has donated to the MVCO. It will need to be determined exactly how and where it could be implemented or installed. It is his older, used set, but should have a few good years left. Don realized that the current TV no longer works with the digital broadcast signal and this new monitor should be a very fine replacement. There was a round of applause and appreciation. Thanks Don for this great upgrade to our AV system.

MINUTES OF THE DECEMBER MEETING

DECEMBER 12, 2009 at Boardman Park

At 7:50 PM President Sam DiRocco called the meeting to order. The Secretary commenced with roll call which indicated 32 members present. Seventeen guests increased the count to 49 people total. Sam began with a word of thanks to Tony Mehle for the sumptuous meal that he provided. Tony and his family (wife Irene and daughter Stephi) worked very hard to put this together. It was a most enjoyable event. A round of applause was in order and was so given. We are a fortunate lot.

A call for the reading was made. A motion to suspend the reading was made by Greg Higgins with a second from Bob Danko. The November minutes were accepted by voice vote.

TREASURER'S REPORT: The Report was read by Steve Bartos. There were no questions or discussion. On a motion by from several members and a second from Greg, the Report was accepted as read. The report follows:

General Fund	**11/1 thru 11/30 2009**	
OPENING BALANCE:	$ 6,659.05	
CLOSING BALANCE:	$ 7,724.84	
AVAILABLE FUNDS:	$ 7,474.84	
INCOME:		
RAFFLE TICKETS (CHRISTMAS)		$ 535.00
CHRISTMAS DINNER RESERVATIONS		240.00
RASC HANDBOOKS		160.00
DUES 2010		90.00
ASTRONOMY CALENDARS		30.00
DONATION (P. PLANTE)		10.00
INTEREST		0.79
TOTAL INCOME		*$ 1,065.79*
EXPENSES:		
CK# XXXX NO EXPENSES IN NOVEMBER		$ 0.00
TOTAL EXPENSES		*$ 0.00*
Reserved Funds		
KEY DEPOSITS		$ 250.00

2010 DUES PAID: DOC KEELEY, J. R. PANDIAN, P. PLANTE

CORRESPONDENCE: No mail received at the P.O. Box.

COMMITTEE/OFFICER REPORTS: *OAD FUND:* Tony Mehle reported that there was no change in Wells Fargo Money Market Fund since the last report. The Fund closed at $3,914.12. Yield remained the same.

OBSERVATORY DIRECTOR'S REPORT: Greg has removed the benches and tables from the steak fry and the lights have been removed from the stage as well. We have the new 42" monitor as previously reported by Don. Everything else was normal. The repair work on the 16" building will now have to wait until spring as time to get it done ran out before the early darkness and cold temps took over. Bill Pearce had pricing on spouting, noting that either aluminum or vinyl were both about $9 per ten foot length (at that time). He recommended the vinyl as it is easier to work with and seems more durable. It also comes with down spouting. Seamless gutters were too expensive. Having a contractor install the spouting was discussed but a few of us could get the job done for around $100. Rosemary cleaned out the refrigerators of all condiments and other foods. What was possible to salvage was here at the meeting. Members were encouraged to find their stuff and take it home. What is left would be tossed.

OLD BUSINESS: Phil Plante noted that he has received a few emails about when our 2010 OTAA dates are. He has given tentative dates of May 15 for the Scenic Vista OTAA Stargaze (based on new moon weekend) and August 14 for our regular OTAA at the MVCO. This is a near 1st quarter moon but catches the end of the Perseid meteor shower. He had asked many members since summer which they prefer (new moon on Aug. 7 or Perseids on Aug. 14). Everyone liked the Perseid date. At this meeting that remained the general consensus. Thus these dates are official (May 15, August 14). Bill Pearce asked for a flier on the August OTAA so that he may include it in his letters to vendors for prize donations. One will be forthcoming. There will be two openings for Trustee positions. The Board will appoint one position (2 year term) and the membership will elect the other for a one year term, at the January meeting. No one has come forward yet so if you are interested please contact one of the current trustees and they will inform the Board.

NEW BUSINESS: Given under "Old" but is probably new business; Sam reminded the membership about the Telescope Training event at YSU on January 16. We are asked to help people learn how to use their telescopes- probably new Christmas presents. Stay tuned to the email list for exact times. Please consider attending and helping where you can.

GOOD OF THE SOCIETY: Jodi McCullough spoke about the discount subscription plan to *Astronomy Technology Today* magazine. It is available to club members for $14 per year, 6 issues. Regular cover price is $5 per issue. In addition the MVAS gets a subscription, 50 copies to pass out at events and two gift subscriptions (for prizes). Several were interested. She would find out if individuals can apply or if they have to go through a club officer. There was no mention of a minimum number of subscribers. This looks like a good program and it will be perused. Stay tuned for the particulars.

The annual Christmas Raffle was held. The tickets had been mixed on and off during dinner. Steven Bartos drew the tickets, read and confirmed by Sam and Harry. The $250 prize went to Yoshi Miyashita. The $500 prize went to Tony Mehle. The $1,000 grand prize also went to Tony Mehle. Tony then asked that the $500 prize be re-drawn. The second time around, Sam DiRocco was the winner of the $500 prize. Congratulations to the winners Yoshi, Sam and Tony. A thank you to Tony for giving someone another chance at the $500 prize. [Tony was also the top seller with 150 tickets and won that prize too.]

Next, Harry Harker presented certificates of appreciation on behalf of the MVAS, to both Allen and Bette Heasley. We

recognize their lifetime of dedication, diligent work and guidance - both spiritual and practical in nature. Allen remarked that he is amazed at the efforts to keep things going. He has enjoyed his return these last 5 years. If he had to give any advice, he said that we would do best to keep electing the officials that have been able to get things done. He wished us all luck in our future efforts. He and Bette will be moving to Colorado in January but will remain in touch via the MVAS email group. A round of applause and best wishes went out to both of them.

VISUAL REPORTS: None were called for.

ADJOURNMENT: Adjournment came at 8:56 PM. We send a special thanks to our hosts the Mehle Family. The next meeting will be at YSU on January 30, 2010. Meeting begins after the 8:00 PM planetarium show. Scheduled hosts are the Bartos family and Phil and Larry Plante. PASSWORD: name an asteroid.

-minutes by Phil Plante

After the meeting, most attendees stayed to watch a one hour DVD slide show on the history of MVAS. Produced by Phil Plante it was well received.

MVAS REMINDERS

It is that time of year again when fees for your 2010 memberships are due. Some have already paid, but the official payment deadline is the January meeting. There is a grace period of a few months, but please submit your dues as soon as you can, to the Treasurer. We will be keeping a close tab this year as we have let a few long time members off the hook last year. But we are obligated by our Constitution to drop names that are in arrears. Regular membership is $30 per year (16 yrs. and older). A Family membership consists of one Regular membership plus any other person at the same address (at $10 each). They will be listed on the roster and have voting rights (16 years old and over only can vote). A Junior membership is available at $10 per year for individuals younger than 16 years of age (no voting rights). This would suit any young person that is not part of a family membership.

A sign-up sheet for host duties was passed around at the December meeting. November is the only month left open. We will need a host or two for November. Instead of his usual November hosting, Tony has offered to cover the Christmas meeting (again) in 2010, at the same venue. We will need to decide as a group, to accept his tremendous offer. Please consider the November meeting.

There are only 2 RASC handbooks left ($20 ea.) but no calendars are left. Also for sale, we have some MVAS apparel.

MVAS ACTIVITIES

Allen and Bette Heasley will be moving to Colorado in late January, depending on weather. We wish them a safe journey to their new home. They will be moving in with their son in Aurora, Colorado. It was a grand honor to have them stay in the area the last five years. Having been members longer than most of us have been alive, their on-site guidance and inspiration will be missed. We have been given a fine legacy to continue.

Congratulations to Tony Mehle for being the top raffle ticket seller (150) this year. He wins the top seller prize of $250. Other top sellers: H. Harker (20), E. Bishop (16), A. Heasley (14), P. Plante (12), R. Chomos (11). Everyone else had 10 or less. Thanks to one and all. We sold 502 tickets in all.

Observer's Notes.....

FABRY – PÉROT ETALON

Compiled and edited by Barlow Bob

The Fabry – Pérot etalon is at the heart of all modern Hydrogen-alpha and CaK Calcium narrow bandwidth solar filers. Each solar filter manufacturer created their unique patented system to observe a solar image in one wavelength. While some use layers of mica, others use an air spaced design. The Fabry – Pérot etalon was created in the late nineteenth century by two Frenchmen; Charles Fabry and Alfred Pérot.

In the science of optics, a Fabry-Pérot *etalon* is usually made of a transparent plate with two reflecting surfaces. A Fabry - Pérot interferometer is usually made of a transparent plate with two reflecting mirrors. The word etalon is from the French étalon, meaning measuring gauge or standard. Etalons are widely used in telecommunications, lasers and spectroscopy to control and measure the wavelengths of light.

The varying transmission function of an etalon is caused by interference between the multiple reflections of light between the two reflecting surfaces. Constructive interference occurs if the transmitted beams are in phase, and this corresponds to a high-transmission peak of the etalon. If the transmitted beams are out-of-phase, destructive interference occurs and this corresponds to a transmission minimum.

Physicists Charles Fabry (left) and Alfred Pérot (right) published their most important article in 1897 on what is now called the Fabry-Pérot interferometer. Despite the great importance of this instrument for modern research today in physics and astrophysics, its inventors are almost completely unknown to most physicists. The Fabry-Pérot interferometer is a more widely used research instrument today than at any other time in its 100 year history. Its origin derives from the theory of multibeam interference developed by Charles Fabry in 1890-1892, and incorporated into the design of the first interferometer constructed by Fabry and his colleague, Alfred Pérot in 1897.

In the form first developed by Fabry and Pérot, their Fabry - Pérot interferometer consisted of two perfectly flat glass plates coated on their parallel facing surfaces with thin silver films. In the first interferometer these metal films reflected over 90% of the light incident on them. The portion of the light beam incident on the outer surface of one of the plates, and passing through the silver coating, was then trapped between the silvered plates and reflected back and forth a very large number of times. At each reflection, however, a small fraction (1/10 or less) of the incident beam escaped through the second plate. As a result, a large number of parallel beams of light emerged at the same angle at which they had entered the interferometer and could then be focused to an image by a converging lens. The constructive interference of these many parallel beams of light produced very bright and remarkably sharp interference fringes.

By increasing the reflectivity of the plates and their separation, the resolution of the Fabry-Pérot interferometer can be increased until it is finally limited only by the natural line width of the spectral lines emitted by the source.

Later they also made many important contributions to astrophysics, including Fabry's 1913 discovery, with Henri Busson, of the ozone layer in the Earth's atmosphere. Since they used their interferometer to make many important contributions to astrophysics, the names of Fabry and Pérot are more likely to be familiar to astronomers than to physicists. Both were trained as physicists and served as professors of physics, at important French universities throughout their careers. At the beginning of the twentieth century, Fabry and Pérot were highly regarded by physicists throughout the world for their contributions to optics and spectroscopy. Later they made many important contributions to astrophysics. Fabry and Pérot deserve to be better known and more widely appreciated by the present generation of physicists, astronomers and historians of science.

CHARLES FABRY

Charles Fabry (1867 – 1945) was born on June 11, 1867 in Marseille, France, the seaport city on the Mediterranean in southeast France. When he was 18, he entered the Ecole Polytechnique in Paris. After graduating two years later, returned to his native Marseille and in 1889 he received the license to teach at any State secondary school. Fabry taught at Lycées (High Schools) in Pau, Nevers, Bordeaux, Marseille, and finally at the Lycée Saint Louis in Paris.

During this time he was preparing his doctoral dissertation on the theory of multibeam interference phenomena. This topic had been treated as early as 1831 by George Biddle Airy (1801 – 1892), but not with the depth and sophistication Fabry brought to the subject.

Fabry's interest in astronomy, acquired as a student while observing the night sky with his two brothers, led him to apply the Fabry – Pérot interferometer to the study of the spectra of the sun and stars. For work in astrophysics Fabry and Perot found their interferometer especially well suited for obtaining very high spectral resolution for sources of small angular size, like the other planets or stars. It also achieved medium to high resolution for sources of low surface brightness, like nebula or galaxies. In 1911 Fabry and Buisson discovered the "nebulium" lines in the Orion Nebula. In 1913 they were the first to demonstrate that the ultraviolet absorption in the Earth's upper atmosphere was due to ozone. In 1919 Fabry hosted in Paris the first international meeting on atmospheric ozone.

Soon after his arrival in Marseille in 1894, Fabry entered into a close collaboration with Pérot on the design and construction of a multibeam interferometer, based on the theory Fabry had developed. In 1894 Fabry replaced Alfred Pérot (1863 – 1925) as lecturer at the University of Marseille, where he spent the next 26 years, starting as an assistant in de Lepinay's laboratory. In 1904, when de Lepinay retired, Fabry was appointed to fill his post as Professor of Physics at Marseille.

Fabry has described in his own words how the work began on the instrument that later was named after him and Pérot. "The subject on which we began to work had occurred to me, partly by chance, following an observation in an electrical problem. A young physicist who was working with me wished to study the spark discharges passing between metallic surfaces separated by the very small space of a micron or less. He consulted me as to the method which he could employ to measure such small distances. The idea came to me that it would be easy to solve the problem if it were possible to observe the interferences produced across the metal."

During his career, Fabry published 197 scientific papers, 14 books, and over 100 notes, obituaries and popular articles. For his important scientific achievements he received the Rumford Medal from the Royal Society of London in 1918. In the United States his work was recognized by the Henry Draper Medal from the National Academy of Science in 1919 and the Benjamin Franklin Medal from the Franklin Institute in 1921. In 1927 the honor most coveted by French scientists was bestowed on him: He was elected to the French Academy of Sciences.

Throughout his life Fabry was very interested in the teaching and popularization of science. He wrote both textbooks and popular books on science. For many years he taught an introductory course on electro-technology every Wednesday evening. The course was scheduled for 9:00 p.m., but the doors of the large lecture room had to be closed at 8:30 p.m., because no more people could squeeze in. He had the ability to capture a diverse audience of science students, engineers, and working men by his clear, witty words and his skillful use of demonstrations. He was both an outstanding research physicist and a spellbinding lecturer. Charles Fabry was truly the Richard P. Feynman (1918 – 1988) of France.

During World War II Fabry left Paris to carry out secret optics research related to the war effort. At the end of the war he returned to Paris, but his health was failing and he died on December 11, 1945. He added much to the established French tradition in optics, reaching back to Etienne Malus (1775 – 1812) and Augustin Fresnel (1788 – 1827).

His own words may be quoted to summarize his brilliant career: "My whole existence has been devoted to science and to teaching, and these two intense passions have brought me very great joy."

ALFRED PÉROT

Alfred Pérot (1863 – 1925) was born in Metz, France and educated at the Lycee in nearby Nancy and then at the Ecole Polytechnique in Paris. After completing his course of studies in 1884, he returned to Nancy to do research in physics under René – Prosper Blondlot. In 1888 Pérot received his Doctorate degree from the University in Paris. After receiving his degree, he was appointed a lecturer at the University at Marseille. He began work in the rapidly developing field of industrial electricity, publishing some research on the electromagnetic waves that Heinrich Heretz had discovered in Karlsruhe in 1888. Soon he became a consultant to the emerging electrical industry. In 1894 he received a special appointment as Professor of Industrial Electricity at Marseille. It was at this time that his fruitful collaboration with Fabry began. Their first research together was the development of the inferferometer that brought them lasing fame. On this project, as in most of their subsequent collaborations in the years 1894 – 1902, Fabry handled most of the theoretical planning, optical measurements, and calculations, while Pérot contributed his great mechanical skill to the design and construction of the instruments needed for their research. Pérot liked to gather a group of talented technicians around him for the construction of needed research apparatus. The first Fabry – Pérot interferometer was undoubtedly so successful because of Pérot's great talent for designing and building equipment.

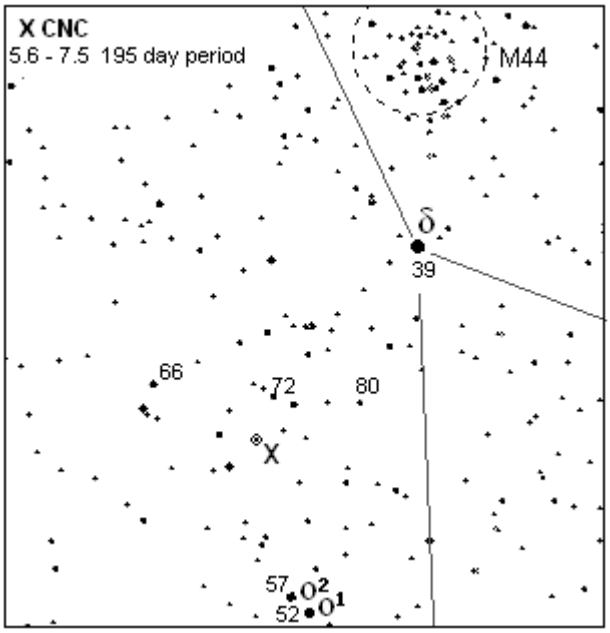
Fabry and Pérot constantly improved their interferometer, and began to apply it more and more to astrophysical problems. They soon discovered small systematic errors in the earlier work of Kayser and Runge (1888) and that of Rowland (1901) on the solar spectrum. These researchers both had employed large Rowland gratings ruled in Rowland's laboratory in Baltimore. The more accurate Fabry – Pérot interferometer measurements showed convincingly that the solar wavelengths obtained from the grating spectra were too high. The Fabry – Pérot interferometer soon became the preferred instrument for highly accurate wavelength measurements on spectra, whether obtained from sources in the laboratory or in the universe of stars and galaxies.

In 1901 Pérot was asked to organize and direct a new laboratory in Paris. He did an excellent job, but soon grew weary of the heavy administrative load that fell upon him. He resigned this position in 1908 to become a professor at Ecole Polytechnique as successor to Henri Becquerel (1852-1908), while doing most of his research at the Meudon Observatory near Versailles. There Pérot devoted himself more and more to solar physics, and especially to the use of the Fabry – Pérot interferometer for the measurement of Doppler displacements of solar spectral lines. For the remaining years of his career, a deep interest in the relationship between laboratory physics and astrophysics motivated his research. He also continued some work on electricity, making contributions to the development of the triode vacuum tube, and to telegraphy. In 1920-1921 Pérot attempted to verify the gravitational redshift predicted by the general theory of relativity, but failed in this overly ambitious endeavor. He served as a member of the French Bureau of Weights and Measures. In 1915 he published an interesting booklet on the decimal metric system.

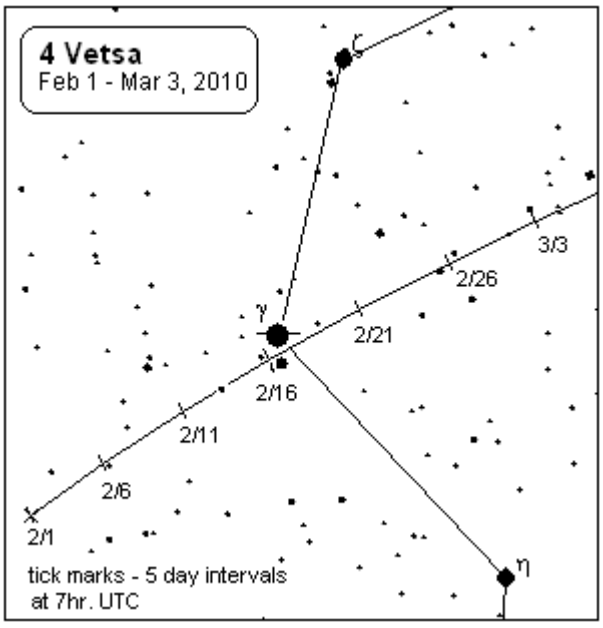
Alfred Pérot died on November 28, 1925, at the age of 62. His colleague and close collaborator, Charles Fabry outlived him by 20 years. Pérot was not well known by physicists outside of France. He preferred to remain with his family rather than travel abroad for conferences and meetings. This may explain why Alfred Pérot is not better remembered today.

MVAS OBSERVER CHARTS

Variable star of the month: **X Cancri** (*abbrev:* X Cnc). Located just south east of the Beehive (M44) X Cnc is an easy binocular variable to find and follow. Most of the time it seems to hover around maximum light in the 6th magnitude range. It usually has a distinctive yellow-gold appearance that makes it a bit easier to pick out from surrounding stars of about the same magnitude. Use the chart below and keep a steady watch, these next few months. Look for any drop in magnitude (or rise for that matter!)



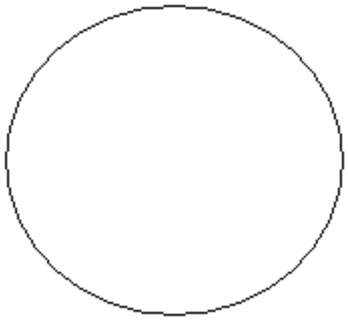
Asteroid of the month: (**4) Vesta.** We begin this year watching Vesta for a while. It is the brightest asteroid in the sky right now. In Leo, it will be well placed for springtime observing. Should be a nice find in binoculars. Once you get familiar with the field you should be able to follow its motion against the background stars from week to week.



MVAS OBSERVATIONS - DUE FEBRUARY 2010

OBSERVER_____

Featured object: Mars. It's cold out; The skies are usually cloudy this time of year. But Mars only comes around every two years. The apparent maximum diameter won't be that big this time (14"). But we should take advantage of any clear night to observes this opposition and the largest appearance of Mars this year. Please try a sketch below. Use the circle as the planet's disk.



Mars Observation:

Date:_____ Time(EDT)_____ Scope_____

X Cnc magnitude estimates:

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

(4) Vesta Observations:

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

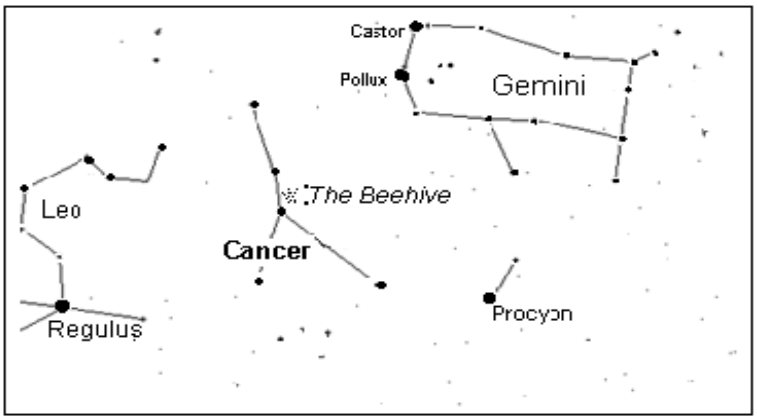
Objects in Cancer to Observe

Object	Date	Scope	Object	Date	Scope	Split?
M- 44	_____	_____	ι Cnc	_____	_____	Y / N
M- 67	_____	_____	57 Cnc	_____	_____	Y / N
N- 2775	_____	_____	Σ 1245	_____	_____	Y / N

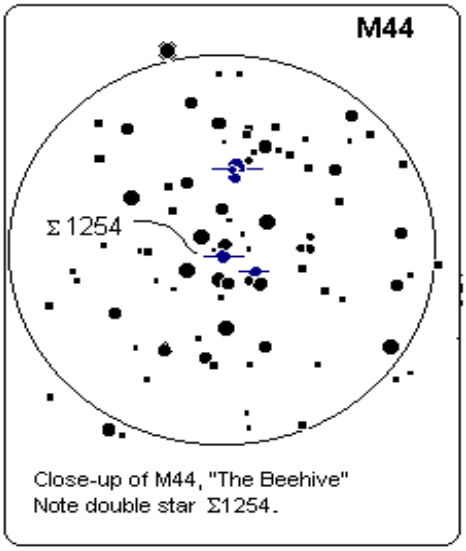
Lunar Occultations (see Sky Almanac):

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

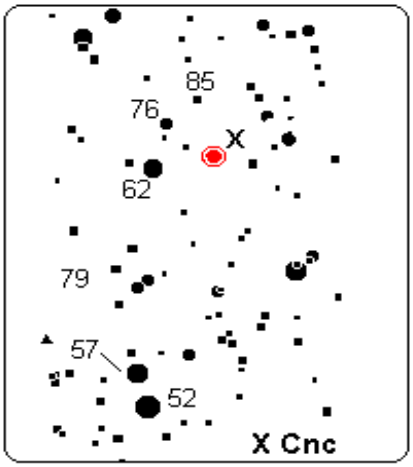
Constellation of the Month — Cancer

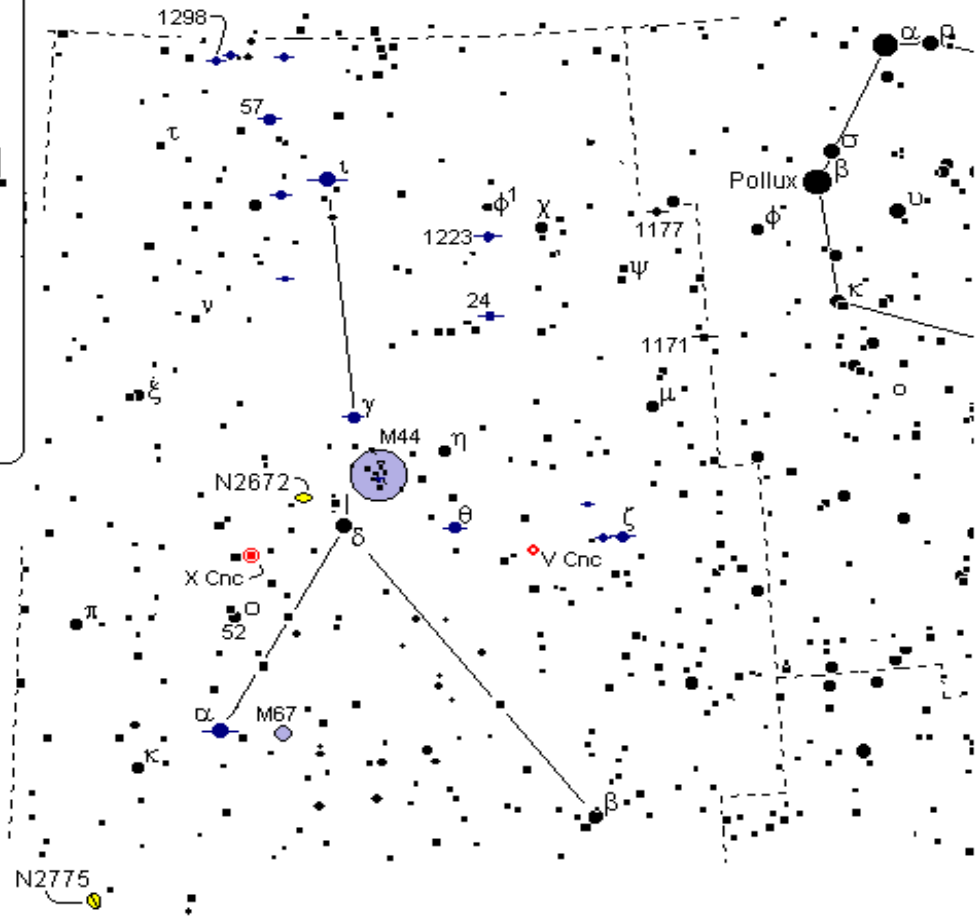


From January to February, you'll find Cancer the Crab about half-way up in the east around 9 PM. Between Leo and Gemini, it is a faint constellation for sure. Use binoculars to find M44- The Beehive. This might be easier to spot than the constellation is with the un-aided eye. Try a little lower to the left for the tiny haze of M67. These are the only bright deep sky object to be had. There are galaxies, but most are fainter than 12.8 mag. There are plenty of nice doubles to put your scope on. Give them a try. The variable X Cnc is an easy target for binoculars. Try to follow X CNC all thru spring and summer. It has very subtle changes.



Close-up of M44, "The Beehive"
Note double star Σ1254.





DEEP SKY

	mag.	size	type	
M44	3.1	95'	OC	50 stars
M67	6.9	29'	OC	200 stars
N2775	11.0	4' x 3'	GALAXY	
N2672	12.7	3' x 3'	GALAXY	

VARIABLE STAR:

X Cancri 5.6 to 7.5mag.
195 day period

DOUBLE STARS

α	4.2 - 11.8	11"	white, red
ζ	5.1 - 6.2	5.7"	lemon, yellow
ι	4.0 - 6.6	31"	yellow, blue
24 CNC	6.9 - 7.5	5.7"	amber, silver
57 CNC	6.1 - 6.4	1.5"	both citrus-orng.
Σ 1171	6.4 - 10.9	2.8"	yellow, orng.
Σ 1177	6.6 - 7.5	3.5"	green, yellow
Σ 1223	6.3 -6.3	5.1"	- - -
Σ 1254	6.4 - 10.4	21"	yellow, orng.
Σ 1298	6.0 - 8.1	4.5"	white, blue

Check list

_____ α
_____ ζ
_____ ι
_____ 24 CNC
_____ 57 CNC
_____ Σ 1171
_____ Σ 1177
_____ Σ 1223
_____ Σ 1254
_____ Σ 1298

_____ M44
_____ M67
_____ N2775
_____ N2672

Instruments used:
_____ on _____
_____ on _____
_____ on _____
_____ on _____

X Cnc _____ mag. on ___/___/____
X Cnc _____ mag. on ___/___/____

2010 FEBRUARY SKY ALMANAC

Solar and Lunar (EST).

Date	Sunrise	Moonrise	Moonset
1	7 : 35	9 : 08P	x : xx
5	7 : 31	12 : 45A	x : xx
9	7 : 26	4 : 43A	x : xx
13	7 : 21	6 : 57A	x : xx
17	7 : 16	x : xx	9 : 48P
21	7 : 10	x : xx	1 : 03A
25	7 : 05	x : xx	4 : 54A
1	6 : 58	7 : 55P	x : xx

PLANET WATCH

	Mars	Saturn	Mercury
Date	*Transits*	*Rises*	*Rises*
1	12:29A	9:50P	6:16A
5	12:07A	9:34P	6:21A
9	11:39P	9:17P	6:27A
13	11:18P	9:00P	6:32A
17	10:57P	8:43P	6:36A
21	10:38P	8:26P	6:39A
25	10:19P	8:09P	6:42A
1	10:00P	7:52P	6:44A

February 2010

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 ○						

Asteroid for February 2010 (4) Vesta

Date	Rises	RA hr. min	Dec. deg.	Alt.	Azm	Magnitude
		topocentric				
1	7 : 02 PM	10 : 33.7	+17.3	66º	173º	6.4
7	6 : 30 PM	10 : 29.1	+18.2	67	190	6.3
13	5 : 57 PM	10 : 23.8	+19.1	66	207	6.2
19	5 : 25 PM	10 : 18.1	+19.9	63	222	6.1
25	4 : 52 PM	10 : 12.2	+20.7	60	235	6.2
1	4 : 20 PM	10 : 08.3	+21.1	57	242	6.3
	EST	(2:00am EST)		(2:00am EST)		

Variable Star of the Month: **X CNC** **5.6 - 7.5mag** **195 day period**

Celestial Highlights

Date	hr. UT	
1	00	R Lep at max. 6.8mag.
5	23.7	**LAST QUARTER MOON**
5	5.1	Algol at minimum
12	0.0	Mars: Syrtis Major @ CM
13	0.0	Mars: Syrtis Major @ CM
14	2.9	**NEW MOON**
18	0.0	Vesta at oppostion
22	0.7	**FIRST QUARTER MOON**
22	2.5	best Feb. lunar occult.
24	5.0	Moon 0.7º N. of M35
29	3.5	**FULL MOON**

T

LUNAR OCCULTATIONS FOR: FEBRUARY 2010

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	1	15	52	1	06	15	52	R	94 -	50º	154º	ZC 1564	6.7	356º	0.57"
8	5	29	05	8	10	29	05	R	26 -	12	142	BF OPH	7.5	249º	.050"
8	6	00	51	8	11	00	51	R	26 -	15	149	ZC 2458	6.3	272º	NA
16	18	22	30	16	23	22	30	R	07+	25	252	19 PSC	5.0v	250º	NA
20	16	21	08	20	21	21	08	D	38+	66	143	eps Arietis	4.7	078º	1.40"
20	18	55	10	20	23	55	10	D	39+	63	283	SAO 75705	7.8	100º	NA
21	21	35	59	22	02	35	59	D	50+	46	263	36 TAU	5.4	123º	.027"
22	18	09	51	22	23	09	51	D	60+	69	136	98 Tau	5.8	159º	95.0"
23	23	44	02	24	04	44	02	D	73+	45	265	5 GEM	5.8	114º	.050"
24	18	46	12	24	23	46	12	D	81+	54	110	ZC 1078	6.0	129º	NA
24	21	15	53	25	02	15	53	D	82+	71	181	SAO 79126	7.6	134º	NA
25	0	18	48	25	05	18	48	D	83+	48	257	ZC 1102	7.0	113º	95.0"

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=0º East=90º South=180º West=270º

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

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

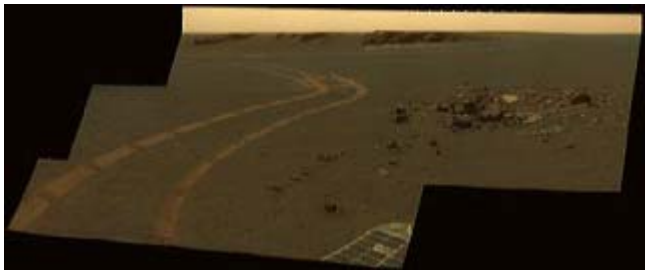
GALLERY…..

Mars, being there….

Mars comes to opposition this month on the 29th. This puts it in a relatively good viewing position a few hours after sunset. It will be even higher in the sky, at the same time of night, during February. But it will be quickly shrinking in apparent diameter. At best, it will only be 14.1 arc seconds in diameter (at opposition). So the best chance for viewing surface details will be had in January and February when the disk appears biggest. There will opportunities in March and April, but they will be more difficult observations. All this means is that if you want to catch Mars at its best this apparition, you'll have to battle the cold night air of January and February. Just remember that it rarely gets above 32° F on a hot day on Mars. So when you observe, pretend you are enjoying the nice tropical weather of Mars. Like being there.

But if you want really close-up views you'll have to fire up the internet and cruise the NASA sites for images received from those wonderful rovers and orbiters currently exploring Mars. Below are a few of the recent images from Mars, which should give you a sense of being there.

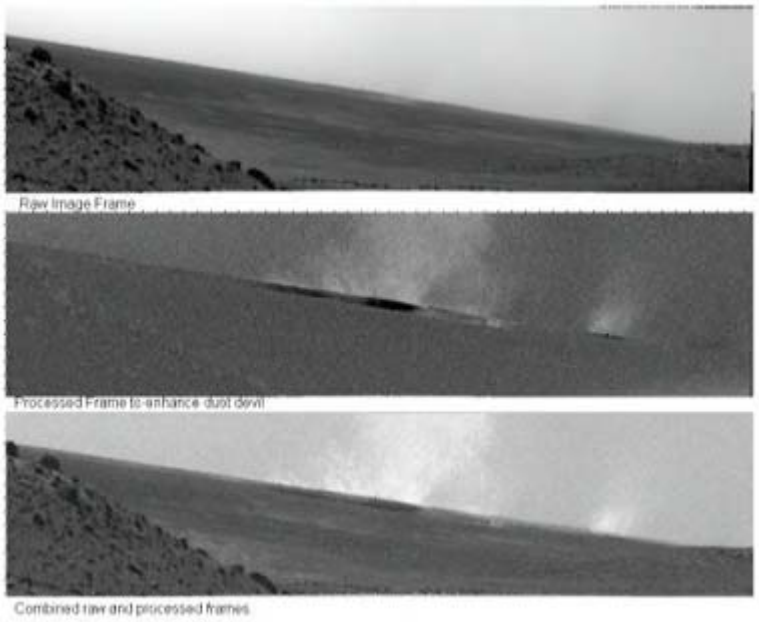
Above: Over-winter site for *Spirit* on the edge of "Home Plate Plateau". Feb 15 2008. (false color image)



First attempt at on-board computer navigation by *Oppurtunity* to avoid obstacles, leaving Victoria Crater. Jan 8 2008.

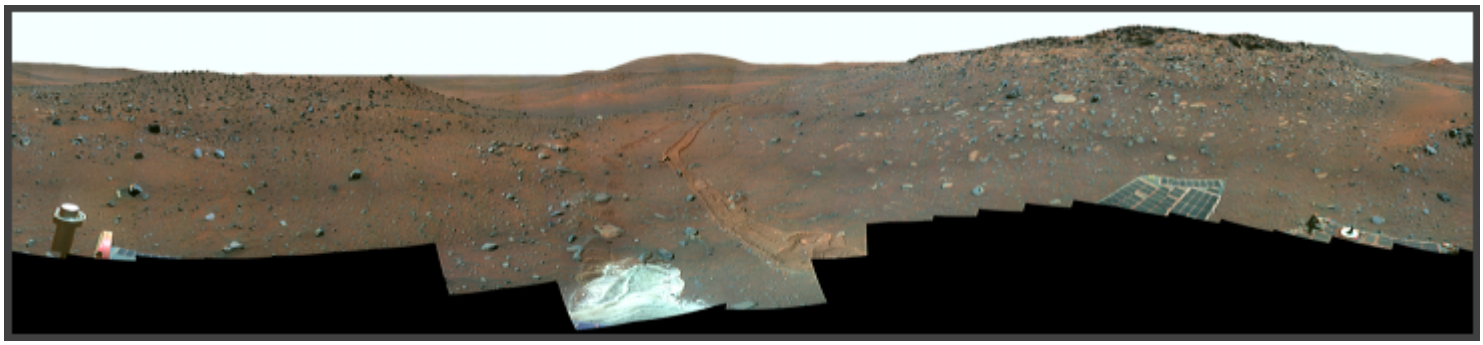
Below: *Oppurtunity* panoramic view of 'Santorini". Nov 23, 2008. It was on the way to Endeavor Crater, spending 5 weeks at this site. Oppurtunity had just left Victoria Crater in August '08.

Above: April 8, 2009 Spirit was headed towards the mound at upper left called "Von Braun". It was 525 ft. away when the image was obtained. Mission planners where considering it a destination for investigation. An in-operative front wheel hindered progress.

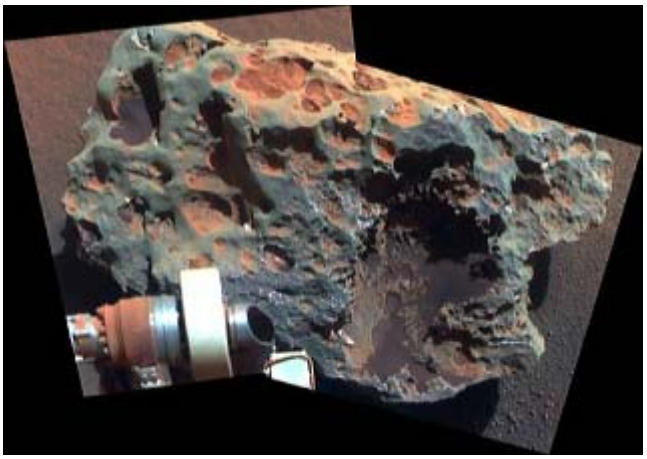


Above: Dust devils imaged by *Spirit* on July 14, 2009.

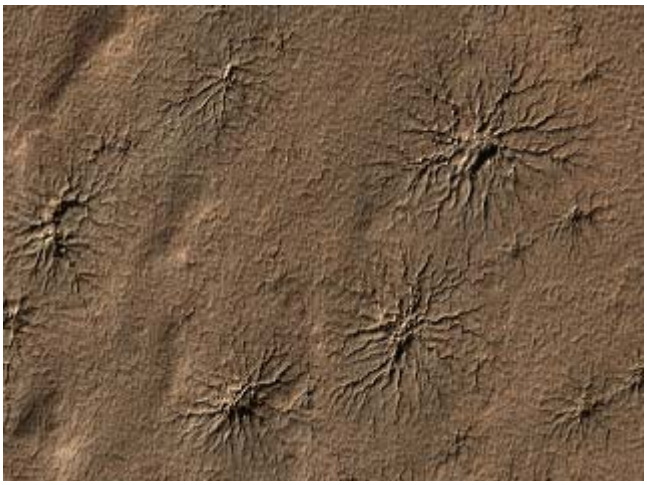
Top image is a raw image file. Middle image was processed to bring up detail in the dust devils. The bottom image combined the raw and enchenched image. (NASA processing)



Above: Composite panoramic view called “Calypso” from *Spirit.* Hundreds of images were used, taken May-June 2009. Home Plate dominates the right side, Von Braun is to the left. Husband Hill in the mound at center. Spirit is currently stuck in the sand at this site called Troy. (false color is used to tell difference in chemical composition in the rocks and soil).

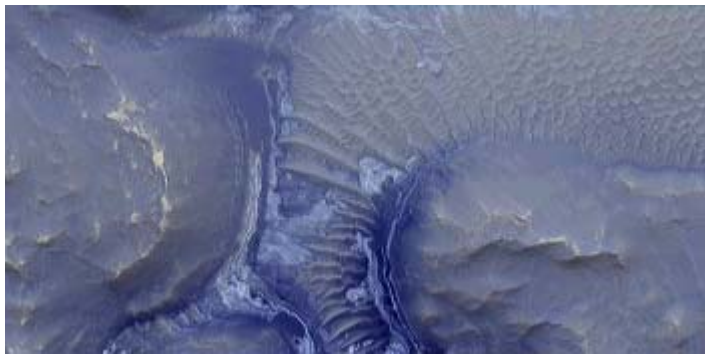


Above: *Oppurtunity* came across a meteorite and made a close-up examination. Aug. 10, 2009



The *Mars Reconnaissance Orbiter* (MRO) captured radial spider-like channels carved by evaporating dry ice in the south polar region of Mars. Scientist call these features araneiform, meaning spider-like. As the CO_2 sublimates under the overlying dry ice, it carves out channels as it heads towards a central vent.
Location 87° south lat. 86.6° E. long. Aug. 23, 2009.

All Gallery images Credit- NASA/JPL



MRO used the HiRes camera to image light toned deposits in two buttes in the Noctis Labyrinthans area. The deposits are believed to be iron-bearing sulphates and clay materials. Sand dunes cover the area top right and between the buttes. Noctis lies just east of Syrtis Major at 11° south lattude. The area shown is about 1 mile wide. Aug. 18, 2009.

MRO used HiRes to image Victoria Crater on July 9, 2009. The crater is 800 meters wide and 200 meters deep. Oppurtunity arrived there in October 2006. It slowly circled the crater observing for many months, eventually entering the crater. It left the crater on August 28, 2008.