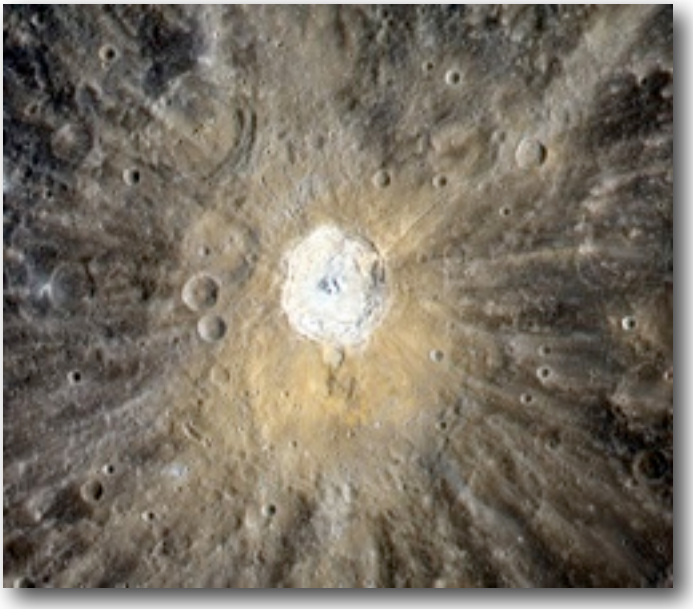
Star Gazer News

Astronomy News for Bluewater Stargazers
Vol 6 No. 4 April 2012

April 2012 Contents



This high-resolution enhanced color view of Kuiper crater (on Mercury) shows not just the bright rays that extend out from this relatively young crater but also the redder color of Kuiper's ejecta blanket. The redder color may be due to a compositionally distinct material excavated from depth by the impact that formed Kuiper.

This image was acquired as a high-resolution targeted observation. Targeted observations are images of a small area on Mercury's surface at resolutions much higher than the 250-metre/pixel morphology base map or the 1-kilometer/pixel color base map. It is not possible to cover all of Mercury's surface at this high resolution during MESSENGER's one-year mission, but several areas of high scientific interest are generally imaged in this mode each week.

Credit: NASA/Johns Hopkins University Applied Physics Laboratory/ Carnegie Institution of Washington

Beware the Conjunctions of March!

I had a nice email conversation with the editor of Universe Today recently. This resulted from a posting on their website about the conjunction of Venus and Jupiter. We had a small disagreement that ultimately was the result of terminology, specifically about the use of the term "conjunction".

The Universe Today posting was a "heads-up" about the Jupiter-Venus events going on in the second week of March. The thing that caught my eye right away was the date the editor gave for the conjunction -Mar 15. (I am sure he did not catch the significance of this date as the Ides of March from the Julian calendar.) I had been using Starry Night to plot the position of Venus relative to Jupiter and noticed that the smallest separation was on Mar 13 when the pair were spaced 2° 59 min 55 s apart.

If someone was out taking images and planning to space out the shots equally, a two day discrepancy is serious, like being two days off for a solar eclipse! The other problem with the Universe Today posting was that it appeared on Mar 13, clearly too late to undo any "damage."

But surprisingly, that reputable source the RASC Observer's Handbook also gave Mar 15 as the date for the conjunction. What was going on?

Suddenly, I realized that something that I knew and had forgotten about had reared it's ugly head. And, more by accident than by design, in the March issue of SGN, I had not used the term conjunction when I listed the close approach in the Sky Calendar. (I did quote the Mar 15 date though, sorry about that.)

Anyway, here is the explanation of why there is a problem.

The term "conjunction" is defined (RASC ObH, Wikipedia, etc.) as the point in time when the two objects have the same Right Ascension, i.e., one above the other along a line to Polaris. The actual separation can be smaller before or after the official conjunction time. There is another term "appulse", which can be used for the point of closest approach but its definition is ambiguous and not clearly distinguished from "conjunction." It would be nice if astronomers made the difference clear and used the terms accordingly. No such luck.

Anyway, that's the dilemma. If you were hoping to get a look at Jupiter and Venus in an eyepiece with a 3 degree FOV, you would have been disappointed on Mar 15 because the closest approach occurred two days earlier -an unlucky day for you as well as Julius C. I pointed that out to the editor of Universe Today (tactfully, I thought). He must still be mulling it over since I have not heard back.

On Sunday Mar 11, Venus and Jupiter were pretty close (3° 26 min). The separation was less on Mar 12 (3° 06 min 11 s) and even smaller Mar 13 (2° 59 min 55 s). On the official conjunction date Starry Night gave the separation as 3° 29 min 49 s .

Photo shot on Mar 11, at 9:00 pm DST from Owen Sound. Canon 50D, ISO 800, exp = 15 s, f/4 at 17 mm focal length.

BAS Executive 2011-2013

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BAS Events Calendar

Mar	**24**	Sat	First Light for Webster 28 at ES Fox Observatory
Apr	**4**	Wed	BAS Meeting Grey Roots 7:00 pm Topic: Eclipses/transits
Apr	**14**	Sat	Community Club Fair (displays), OS Library 10 am to 3 pm
Apr	**21**	Sat	BAS Viewing Lyrid Meteors (20/h) peak ES Fox Obs @dark
Apr	**23 - 29**		**International Astronomy Week**
Apr	**24**	Tue	Celebrate the Night Sky plus Sky Tour Grey Roots 7:30 pm
Apr	**27**	Fri	Coffin Ridge Winery public viewing session @dark
Apr	**28**	Sat	International Astronomy Day, Displays OS and PE 9am to 1 pm
			Public Observing at ES Fox @dark
May	**2**	Wed	BAS Meeting Grey Roots 7:00 pm

The BAS News Page

Webster 28 arrives at ES Fox

The arrival of "Dobzilla" at ES Fox occurred Sunday afternoon Mar 19. In preparation for the official first light Mar 24, a small group of BASers took the scope on an impromptu shakedown "cruise" a few days earlier.

The image above shows Brett doing the grunt work of wheeling the lower assembly out to start the setup. Image at right shows the Webster before it was dressed in its light shroud -an impressive machine.

The lineup at the eyepiece in the top right image was for M42, the Orion nebula. You really have to see it to believe the view!

The collection of planets in the west on Feb 24, 25 and 26 was captured by three photographers from widely different locations: Owen Sound, Arizona and Alberta. The image on the right was taken on Feb 25 by John H. from the hill overlooking Harrison Park. Doug C. caught the moon near Venus on the same night over Limestone Mountain in Arizona and Troy Johnstone captured the view the next night, Feb 26, from Airdrie, AB.

Doug Cunningham took this image through his Takahashi refractor. Data: Canon 50D, ISO 200, 1/400 s,Feb 25, 10 pm, AZ time

John H image with a 24 mm focal length, Data: Canon 50D at f/4.0, ISO 1250, 1/2 s, Feb 25, 8 pm Mercury is marked by lines in lower right of image.

Troy Johnstone image with a 24 mm focal length, Data: Nikon D300 at f/2.8, ISO 500, 20 s,Feb 26, 9:17 pm. Troy's website is www.troyandnaomi.com

Jupiter
Venus
Moon
Mercury

→

Moon drips gold!! This image is a mystery that needs explaining. The dripping "fire" from the moon lasted for several minutes and seemed to be related to the tree but occurred even with the moon above the tops of the branches. The features do not appear to be cloud related. Any ideas?? I'm stumped.

Canon 50D, ISO 1250, fl = 400 mm, f/5.6, 2 s exp. Feb 25, 10:41 pm

Why Are Lunar Shadows SO Dark?

by JASON MAJOR *on* April 6, 2012 Universe Today

A lunar boulder catches the last edge of the setting sunlight in this image from the Lunar Reconnaissance Orbiter Camera. The boulders litter the floor of an unnamed 3.5 km wide (2.17 mile wide) crater located within the much larger crater Lobachevskiy. The smaller crater's rim casts its shadow along the left side of the image, and raises the question: why are shadows on the Moon so dark?

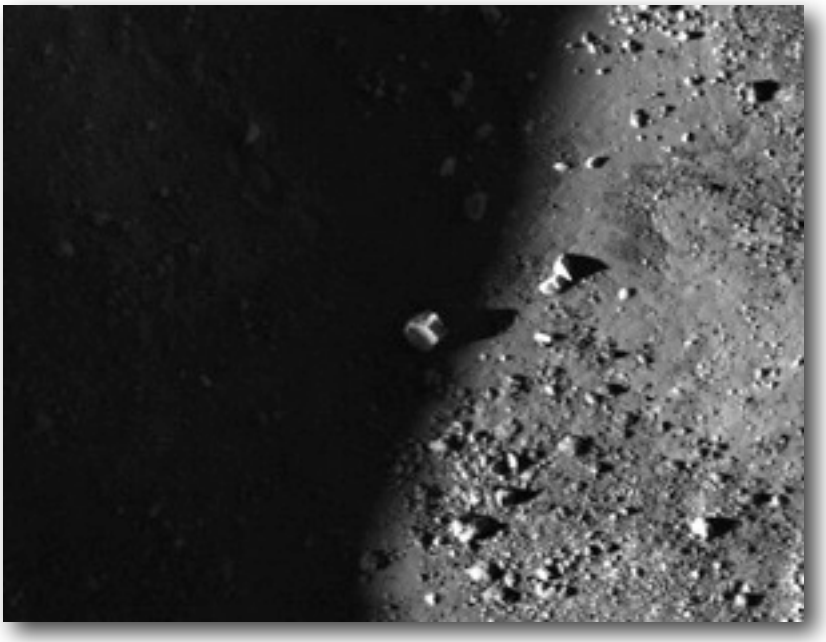
On Earth, air scatters light and allows objects not in direct sunlight to be still well-lit. This is an effect called *Rayleigh scattering*, named for the British Nobel-winning physicist Lord Rayleigh (John William Strutt.) Rayleigh scattering is the reason why the sky is blue, and (for the most part) why you can still read a magazine perfectly well under an umbrella at the beach.

On the Moon there is no air, no Rayleigh scattering. So shadows are very dark and, where sunlight hits, very bright. Shadowed areas are dramatically murky, like in the LROC image above, yet there's still *some* light bouncing around in there — this is due to reflected light from the lunar surface itself.

Shadow world revealed! (NASA/GSFC/Arizona State University/J. Major)

Lunar shadows being wrong are a major argument made by Moon "Hoaxers" to support claims that the Apollo missions were faked. Ian W. Goddard explains how shadows work on the moon in his article on Phil Plait's Bad Astronomy site:

http://www.badastronomy.com/bad/tv/iangoddard/moon01.htm



A lunar boulder peeks out into the sunlight. (NASA/GSFC/ Arizona State University)

Lunar regolith is composed of fine, angular particles of very reflective dust. It tends to reflect light directly back at the source, and will illuminate objects within shadows as well — as seen in Apollo mission photographs. Astronauts within the shadow of the landing modules were still visible, and their suits were well illuminated by reflected light from the lunar surface. Some people have used this as "proof" that the landings were actually filmed on a sound stage under artificial lights, but in reality it's all due to reflected light.Lunar regolith is composed of fine, angular particles of very reflective dust. It tends to reflect light directly back at the source, and will illuminate objects within shadows as well — as seen in Apollo mission photographs. Astronauts within the shadow of the landing modules were still visible, and their suits were well illuminated by reflected light from the lunar surface. Some people have used this as "proof" that the landings were actually filmed on a sound stage under artificial lights, but in reality it's all due to reflected light.

So even though air isn't scattering the sunlight on the Moon, there's still enough reflection to sneak light into the shadows… but not much. It gets dark — and quickly cold — in there!

And if you're one of those who likes to get a better look into the shadows, here's the same image above with the dark areas brightened enough to see details:

Some interesting boulder trails in there!

See this image on Arizona State University's LROC news page http://lroc.sese.asu.edu/news/index.php?/archives/515-Sunset-Boulder.html#extended

and zoom into the full NAC scanhttp://wms.lroc.asu.edu/lroc_browse/view/M134442210RE

Citizen Scientists Find Bubbly MW

April 07, 2012 Adam Hadhazy

A team of volunteers has pored over observations from NASA's Spitzer Space Telescope and discovered more than 5,000 "bubbles" in the disk of our Milky Way galaxy. Young, hot stars blow these bubbles into surrounding gas and dust, indicating areas of brand new star formation.

Upwards of 35,000 "citizen scientists" sifted through the Spitzer infrared data as part of the online Milky Way Project to find these telltale bubbles. The volunteers have turned up 10 times as many bubbles as previous surveys so far.

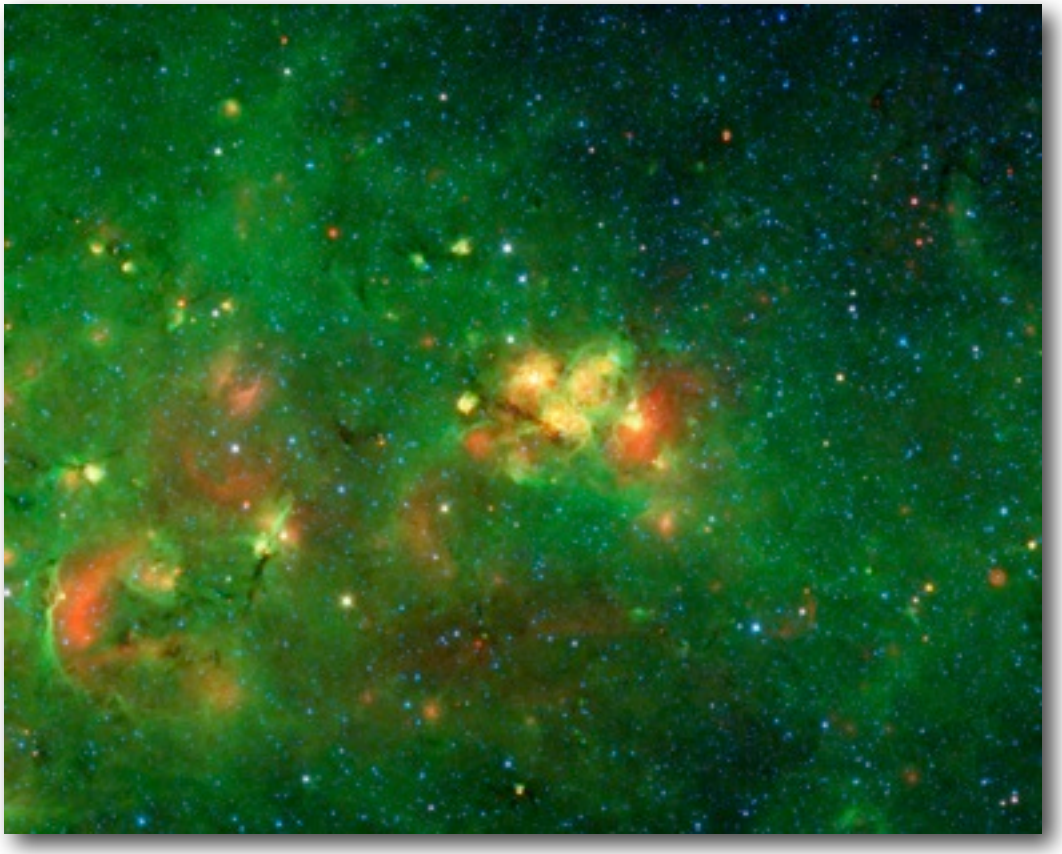
"These findings make us suspect that the Milky Way is a much more active star-forming galaxy than previously thought," said Eli Bressert, an astrophysics doctoral student at the European Southern Observatory, based in Germany, and the University of Exeter, England, and co-author of a paper submitted to the Monthly Notices of the Royal Astronomical Society.

"The Milky Way's disk is like champagne with bubbles all over the place," he said.

Computer programs struggle at identifying the cosmic bubbles. But human eyes and minds do an excellent job of noticing the wispy arcs of partially broken rings and the circles-within-circles of overlapping bubbles. The Milky Way Project taps into the "wisdom of crowds" by requiring that at least five users flag a potential bubble before its inclusion in the new catalog. Volunteers mark any candidate bubbles in the infrared Spitzer images with a sophisticated drawing tool before proceeding to scour another image.

"The Milky Way Project is an attempt to take the vast and beautiful data from Spitzer and make extracting the information a fun, online, public endeavor," said Robert Simpson, a postdoctoral researcher in astronomy at Oxford University, England, principal investigator of the Milky Way Project and lead author of the paper.

The data come from the Spitzer Galactic Legacy Infrared Mid-Plane Survey Extraordinaire (GLIMPSE) and Multiband Imaging Photometer for Spitzer Galactic (MIPSGAL) surveys. These datasets cover a narrow, wide strip of the sky measuring 130 degrees wide and just two degrees tall. From a stargazer's perspective, a two-degree strip is about the width of your index finger held at arm's length, and your arms opened to the sky span about 130 degrees. The surveys peer through the Milky Way's disk and right into the galaxy's heart.



The bubbles tagged by the volunteers vary in size and shape, both with distance and due to local gas cloud variations. The results will help astronomers better identify star formation across the galaxy. One topic under investigation is triggered star formation, in which the bubble-blowing birth of massive stars compresses nearby gas that then collapses to create further fresh stars.

"The Milky Way Project has shown that nearly a third of the bubbles are part of 'hierarchies,' where smaller bubbles are found on or near the rims of larger bubbles," said Matthew Povich, a National Science Foundation Astronomy and Astrophysics Postdoctoral Fellow at Penn State, University Park, and co-author of the paper. "This suggests new generations of star formation are being spawned by the expanding bubbles."

Variations in the distribution pattern of the bubbles intriguingly hint at structure in the Milky Way. For example, a rise in the number of bubbles around a gap at one end of the survey could correlate with a spiral arm. Perhaps the biggest surprise is a drop-off in the bubble census on either side of the galactic center. "We would expect star formation to be peaking in the galactic center because that's where most of the dense gas is," said Bressert. "This project is bringing us way more questions than answers."

In addition, the Milky Way Project users have pinpointed many other phenomena, such as star clusters and dark nebulae, as well as gaseous "green knots" and "fuzzy red objects." Meanwhile, the work with the bubbles continues, with each drawing helping to refine and improve the catalog.

If astronomy had its own Academy Awards, then this part of the Milky Way would have been the "Favorite Nebula" pick for 2011. Competing against 12,263 other slices of the sky, this got more votes from the 35,000 volunteers searching for cosmic bubbles than any other location.The volunteers are all "citizen scientists" working on the Milky Way Project, scanning a vast collection of infrared images from NASA's Spitzer Space Telescope. Their goal is to identify bubbles that have been blown into gas and dust by stars forming in our Milky Way galaxy. The volunteers study image after image, drawing circles around possible bubbles. Together their efforts have produced a catalog of more than 5,000 bubbles, 10 times what was known before.While scrutinizing each of the images, the volunteers can to bookmark favorite areas. The bright yellow-red nebula at the center of this image garnered the most votes.Interestingly this nebula, which is in the constellation of Scutum, has no common name since it is hidden behind dust clouds. It takes an infrared telescope like Spitzer, which sees beyond the visible spectrum of light, to see through this dark veil and reveal this spectacular hidden

For those interested in counting bubbles and contributing to the Milky Way Project, visit the following link: www.milkywayproject.org . To learn of other citizen science-based efforts, check out the Zooniverse: https://www.zooniverse.org/ .

"Difference Between Living and Living Well"

"That's when I knew …
That's the difference between living and living well,
You can't have it all, all by yourself,
Something is always missing
Until you share it with someone else !"

George Strait Lyrics "Living and Living Well"

I am a great fan of the lyrics of George Strait, a country and western singer. One song in particular is called "Living and Living Well" and I couldn't agree more with the sentiment expressed in the abbreviated lyric above. One of the enduring features of the relationship between my wife, Paula and me over the past 47 years is our shared experiences. Whether it's our family, the astronomy, the travel, the kayaking, or simply the many aspects of family life that we have on this journey, it's the sharing that enriches and validates our experiences. I'm sure this description applies to most successful marriages. So, what does this have to do with astronomy?

As most readers of this column know, Paula and I spend the winter at Arizona Sky Village near Portal, AZ. The skies are wonderful most of the time for naked eye, telescopic, and CCD astronomy. Last week, I was imaging some open clusters in Puppis and Canis Major in preparation for an article in the RASC Journal. What was Paula doing while I was preoccupied? Certainly not watching TV! She was busy with her Canon 12 x 36 IS binoculars, her Celestron Sky Scout, and her copy of Tirion and Sinnott's Sky Atlas 2000. Sitting comfortable on our deck chair she was a navigator on uncharted seas. She was scanning Puppis, Canis Major, Corvus, and Columba with her binoculars. [Some of these sites are described in the Featured Constellation this issue. -ed]. When she found interesting stellar condensations or distinctive asterisms, she would get out the Sky Atlas 2000 and see if they had been plotted. A lot of these binocular jewels were open clusters. I like this method of discovery! When Paula found something interesting she would exclaim " You might be interested in this!" And, even if I had previously viewed the object, this sharing of the night sky experience not only validated our present experience but connected for us past observations with the present. Often we would try to coax out structural details from the barrage of photons striking our retinas. We were not just looking but really observing, where our conscious minds were connected to our eyes! My wife is particularly good at this.

One of the photos that I took that March night shows three open clusters; M46 (with its blue planetary nebula NGC 2438 superimposed), M47, and NGC 2423. Whenever I see this image my memory will return to our shared experience that night.

L to R in Puppis are M46, M47, and NGC 2423 (Cunningham Image) Canon 50D, TAK FSQ 106 on EM 400 mount, exp 100s, ISO 1000

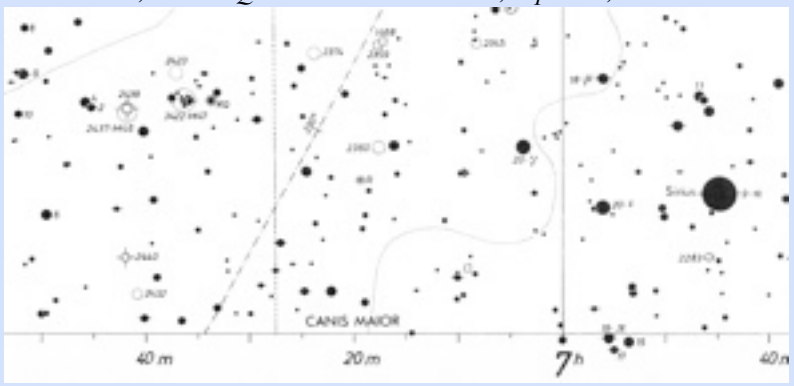


Chart from SkyAtlas 2000 with location of M46 and M47. Look 12° East (left) of Sirius. As described in the article M46 has a neat 10.8 magnitude planetary nebula NGC2438 "imbedded" in it. Actually it is closer to us, 2900 ly vs 5400 ly for M46.

Trumpler Classification of Open Clusters
(from http://x.astrogeek.org/articles/article.php?article_id=14)

Degree of Condensation	
I	Detached clusters with strong central concentration
II	Detached clusters with little central concentration
III	Detached clusters with no central concentration
IV	Cluster not well detached, but has a strong field concentration
Range of Brightness	
1	Most of cluster stars are nearly the same apparent magnitude
2	A medium range of brightness between the stars in the cluster
3.	Cluster is composed of bright and faint stars
Number of Stars in the Cluster	
p	Poor clusters with less than 50 stars
m	Medium rich cluster with 50-100 stars
r	Rich cluster with over 100 stars

Finally, for those of you who might be interested in observing open clusters yourselves, there is the Trumpler Classification System (Robert J. Trumpler (1886-1956) at left. I find it is a wonderful aid in guiding the mind and the eye as you peruse these young star groupings. Using this Classification System on M46, in my above photo, I would class it as Tr II 1r… Trumpler Class II (detached cluster with little central condensation), 1 (most of the cluster stars of similar apparent brightness), r (rich cluster of more than 100 stars) and no associated cluster nebulosity. Try your hand classifying M47 and NGC 2423 in my image above. The good news is that the winter and early spring groupings of OC are still prominent in the evening sky so grab your binoculars and set sail for uncharted waters!

B&J's Excellent Adventure

At the last BAS meeting, mention was made by president Brett that a trip was planned to pick up the Webster 28 inch telescope that BAS has obtained with Trillium money. Mar 15 was departure day for John and Brett, our co-pilots as they made their way south along Highway 21 towards the border crossing at Port Huron. The wait to cross the Bluewater Bridge was less than an hour and we were soon flying through Michigan (gas $ = 4.09 per gal) towards our first stop in Davenport Iowa (1058 km). Once we got to the other side of Chicago, into Illinois, we crossed the Mississippi into Iowa. First time for both of us! There was a beautiful sunlit cloud to the south as we crossed the bridge that looked just like Yoda!

We found out later that earlier in the day a bit to the south of us in Michigan, there was a tornado touch-down and tornado warnings in southern Ontario which thankfully did not produce any activity there. We were the other side of Chicago at the time and just got a few ominous clouds and splatters of rain. The clouds were just pretty to look at as they were backlit with sunlight and produced sun rays and silver linings! There was no loss of life from the Michigan tornado fortunately.

Arriving in Davenport around 8 pm our time, we checked into an inexpensive hotel and went out for a small late supper. Later, since the skies were clear, it was possible to see Venus and Jupiter in the west (and not much else). The lights on the hotel were so bright it actually hurt to walk around outside under them.

The trip to Omaha for the meeting with Jason Davis who was bringing the scope halfway was uneventful and we checked in early. By 6 pm, (right on time) we got a call from Jason Davis and we arranged a meet at his hotel to check out the telescope. He spent the whole evening with us demonstrating the setup of the telescope (not that complicated) and operation of the Argo Navis and ServoCat. The Argo Navis is the "navigation" electronics which uses encoders to determine where the scope is pointing and ServoCat is the system of motors and hand control that moves the scope to the desired object once the object is selected. It was neat to see a giant telescope slewing around at the touch of a button. The same hand control actually gave 3 speeds, -the slowest was the fine centering control as you viewed through the eyepiece. The middle speed was actually high enough to locate targets easily on manual control.

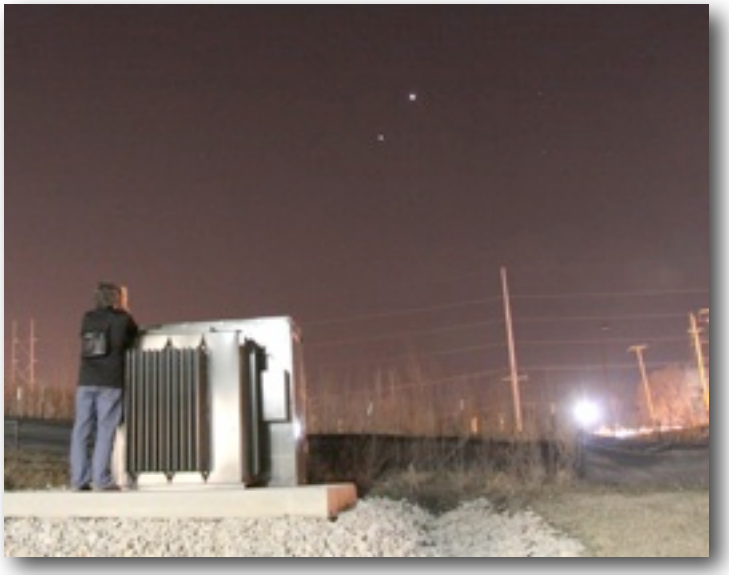
Around midnight we packed the scope into our rental van and said our goodbyes to Jason. In our parting conversation, he suggested we contact Eric Webster in Garden City (a suburb of Detroit) for a visit as long as we were going that way. Webster apparently treats his telescope like children and likes to keep track of where they are.

During day 3 on the road towards home we contacted Eric but unfortunately he had other commitments for the time we were passing through his location and we could not connect. So a long session of driving took us from Omaha to Kalamazoo (about 1000 km) and we paused for the night. The drive next day would bring us home by mid-afternoon.

We rolled into the OEC around 3:30 pm and pretty much had our fears confirmed about the size of the door being too small to allow the rocker box and mirror through. Not a surprise, actually as we had talked about this even before we decided on a 28. Our options to get it through the door include taking the mirror box out every time we move the scope in or out (not our favourite), or acquiring an enclosed, secure trailer that would serve double duty as transport for the telescope (Starfest, for sure) and a secure storage "doghouse" while on site. And yes, as a third option, we could cut out a bigger door in the observatory. Concrete saw anyone?

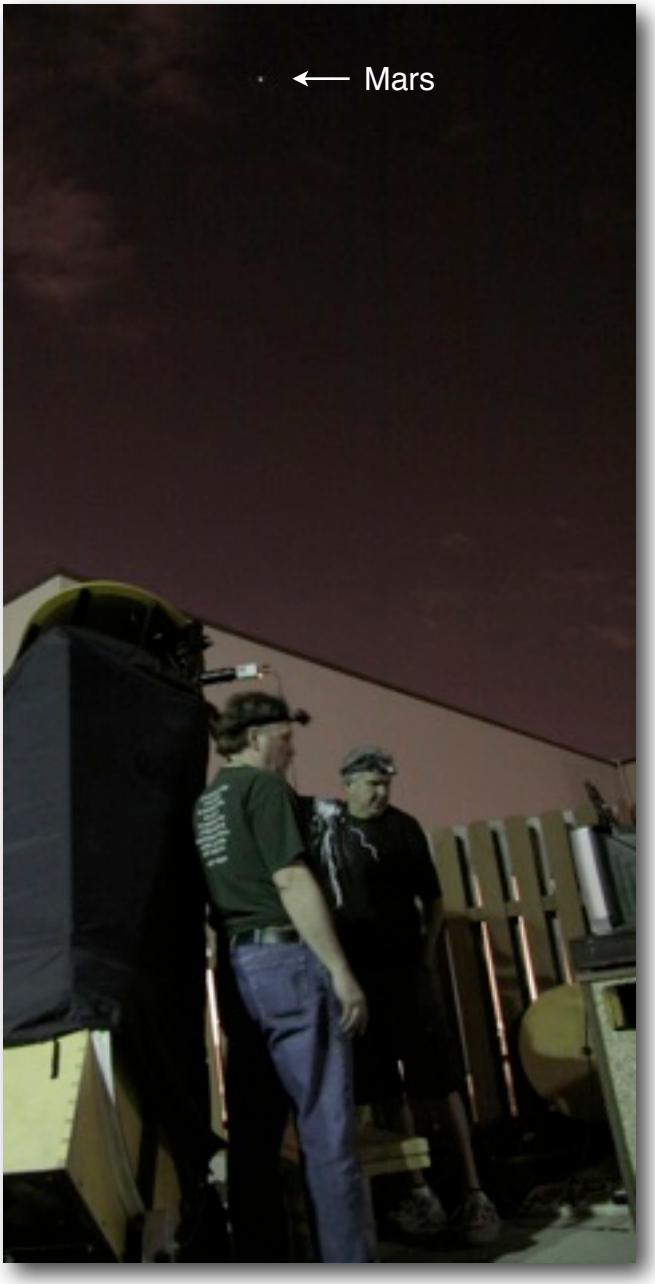
No, we were not trying to rack up the expense money by taking the long way to Omaha. We went past Moscow as well and were not tempted to take that longer route, either.

The Mississippi River forms the border between Iowa and Nebraska as well as a dozen other states along its 4070 km course from Lake Itasca in Minnesota to the delta at New Orleans, Louisiana. We crossed it near Davenport, Iowa at the end of day 1 on the road. Below, Brett checks out Venus and Jupiter with binos from suburban Davenport, Iowa.



The heaviest part of the Webster is the lower component -about 150 lb. Two metal bars attached to wheels help move it around. After the trusses are installed it is an easy lift to get the secondary cage attached. The secondary mirror is installed separately and a quick collimation puts the instrument in shape for star observing.

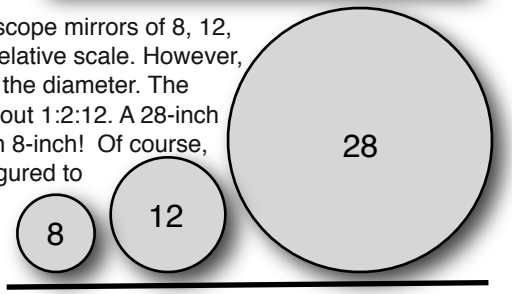
The Webster aka "Dobzilla" Shows its Stuff



Setting up in a hotel parking lot in the middle of Omaha Nebraska is not exactly going to test the capabilities of a 28 inch telescope under ideal conditions. But our mentor Jason Davis, offered to give us both a set up lesson and a hands-on demo of the Mallincam/ Webster scope combo. So after dark, we got the electronics going (via a 120 V hookup from the hotel's electrical supply) and powered up the Mallincam. The image at left shows the camera at the eyepiece just above Brett's head. He and Jason are watching the monitor (image right) showing Mars at about 150 power. It was possible to see a small polar cap and a few faint disk markings on the relatively low resolution colour monitor that Jason brought along.

The location did not lend itself to an extended night of stargazing, and the only two objects that we observed visually were Mars and Polaris. However, the Webster did its first duty as a public education scope since its size attracted a young lad visiting from Oklahoma??? He was amazed at the size of the scope and by the view of Mars on the TV. He had a wry sense of humour for one so young when he commented that girls his age were not impressed by big telescopes. All the people passing by this scope, however, were amazed -males and females!

The three circles at right represent telescope mirrors of 8, 12, and 28-inch aperture drawn to correct relative scale. However, mirror area is a better comparison than the diameter. The areas of the three are 64:144:784 or about 1:2:12. A 28-inch mirror has 12 times the light grasp of an 8-inch! Of course, all of this is wasted if the mirror is not figured to the correct shape.(Remember the HST fiasco?) We are told this W28 has, in fact, a perfectly figured mirror.



SGN Featured Constellations: Hydra, Corvus, Crater and Sextans

Hydra (Sea Serpent)

α–Hydrae - Alphard

Hydra is a long constellation stretching over 100° through the heavens. It is rather difficult to identify because its stars are rather faint, with the exception of Alphard, a 2nd magnitude star. Alphard, also known as Cor Hydrae, the "Dragon's Heart", is a red star and the only bright star in the area. It forms a fat isosceles triangle with Regulus and Denebola in Leo. The head of Hydra, a beautiful compact grouping of stars, lies directly south of the Bee-Hive cluster in Cancer.

Double Stars

	Separation Mag.	(s)	Location	Remarks
ε	3.8-7.8	4	084407	Yellow-Blue
54	5.2-7.1	9	144325	Red-Blue (not on this chart)
Hh 376	5.8-5.9	9	113029	

Messier Objects

	Mag	Location	Remarks
M48	--	081202	Open Cluster.
M68	--	123726	Globular Cluster.
M83	10.1	133430	Spiral Galaxy. [S. Pinwheel Galaxy]

Other Objects of Interest

NGC2548 -A large open cluster with one fine double and many stars of approximately 9th magnitude. Location: 081205

NGC3242 - A very large unusual planetary nebula, seen as a pale blue disc. It is shown to be a ring nebula at high power. Location 102317. ["The Ghost of Jupiter" planetary]

R Cancri - Long period (406 days) variable, mag range 3.5-10; visible to the naked eye at maximum. Location 132713.

[Note: Hydra is the female water snake. There is another constellation called Hydrus, which is a male water snake found in the southern sky between the Large Magellanic Cloud and the star Achernar. Hydrus, like many of the other small southern constellations has only a few bright stars. Hydra is also a constellation of few bright stars but it stretches from about 8 H to 15 H in RA, a span of 100 degrees -more than 1/4 of the sky!-ed]

Corvus (Crow)

α Corvi-Alchiba γ Corvi-Gienah δ Corvi -Algorab

Corvus is a conspicuous constellation, its 3rd and 4th magnitude stars forming a distinctive trapezoidal figure perched on the coils of Hydra. δ Corvi lies about 10° SW of Spica in Virgo. γ and δ Corvi lie on a straight line with Spica. The variable star R Corvi can be seen with fieldglasses when at its maximum magnitude of 5.

Double Stars	Mag.	Sep (s)	Location	Remarks
δ	3.1-9.2	24	122716	Yellow-Lilac; fine contrast; easy
ζ	5.3-13.8	8	121822	
Σ1669	6.0-6.1	6	123913	A fine pair.

Other Objects of Interest

NGC4361 - Planetary nebula. Location: 122119

R Corvi - Long per (317 days) var, mag range 5 -14; Location 121719

Crater (Cup)

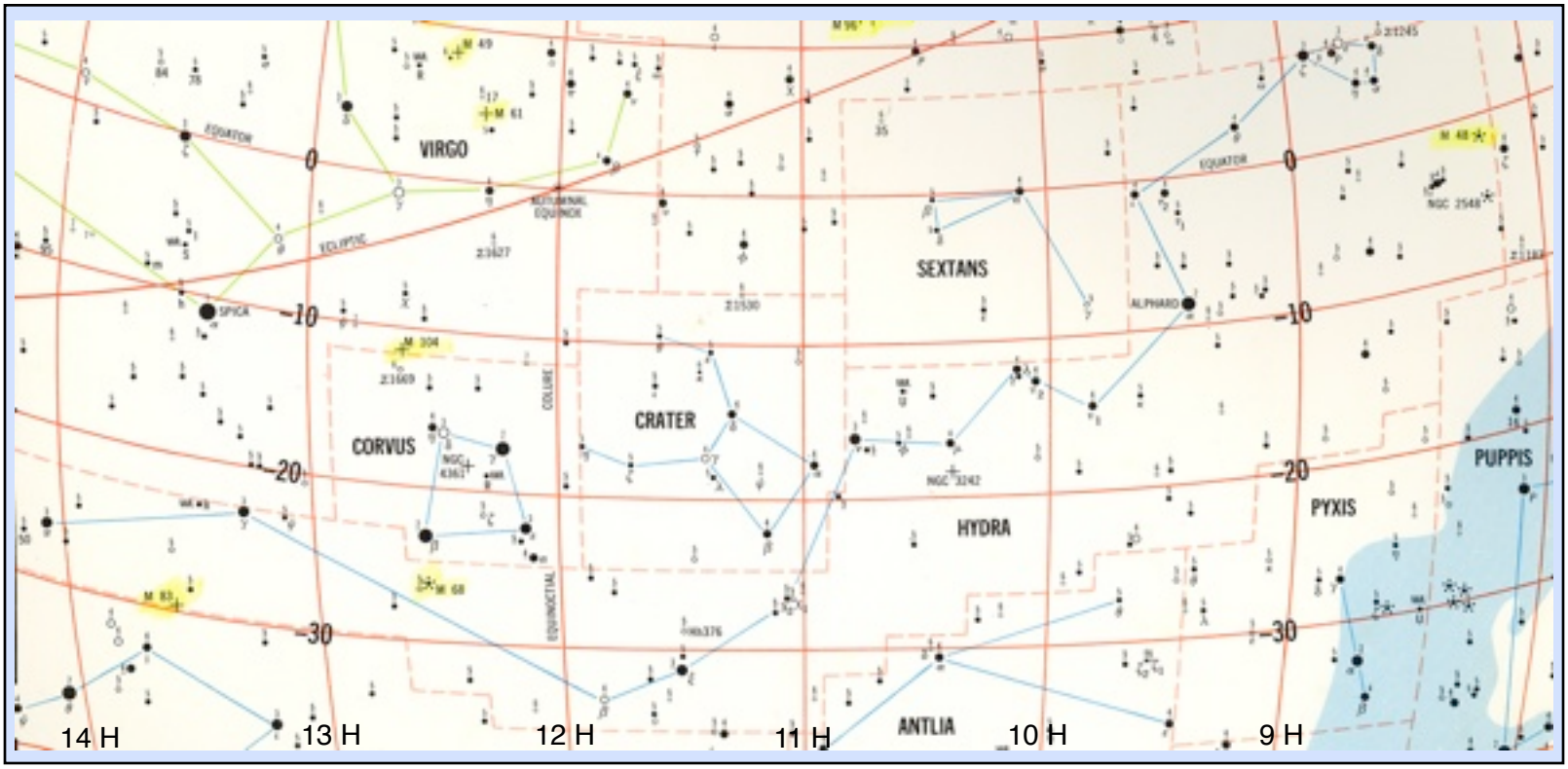
Crater is east of Corvus and about 30° due south of Denebola in Leo. It is a fairly inconspicuous constellation but can be easily distinguished on a clear, dark night. Its stars form a quite recognizable goblet shaped figure. Σ1530 is a double star magnitudes 6.8-8.2, separation 8", location 111407

Sextans (Sextant)

Sextans is a small constellation of very faint stars; the brightest, α Sextantis, has a magnitude of 4.5 and lies about 12° south of Regulus, in Leo. Observe the double star 35 Sextantis, magnitude 6.3-7.4, separation 6". [There is also a faint third companion of 8.1 magnitude at 334 s separation in PA 210° -ed]

Chart Legend
- Star Location
- Double Stars
- \+ Nebulae
- ✶ Clusters
- Variable Stars Var

Star magnitudes are labeled as numerical values above (or near) the star. Underlined values are half magnitudes. Larger star dots denote brighter stars.



Sky Calendar — April 2011

compiled by John Hlynialuk (**stargazer@wightman.ca**) using the Observer's Handbook 2012(RASC), Sky and Telescope and Sky News magazines. Please contact the editor if you

Apr 3	**Venus 0.5° S of Pleiades**
Apr 3	Mars 9° N of Moon
Apr 6	**Full Moon (Grass Moon) rises at 8:18 pm DST**
Apr 7	**Spica 1.5° N of Moon**
	Saturn 6° N of Moon
Apr 13	**Last Quarter Moon rises at 3:18 am DST**
Apr 15	**Saturn at opposition (mag. 0.2 ring tilt = 13.6°)**
Apr 16	Venus 10° N of Aldebaran
Apr 18	**Mercury greatest elongation W (27° mag. 0.2)**
	Mercury 8° S of Moon
Apr 21	**New Moon rises at 6:22 am DST**
	Mercury 2° S of Uranus
Apr 22	**Lyrid Meteor peak (11 pm 20/h)**
	Jupiter 2° S of Moon
Apr 24	**Venus 6° N of Moon**
Apr 29	**First Quarter Moon rises at 11:55 am DST**
Apr 30	**Venus greatest illuminated extent (mag. -4.7)**

BAS Events

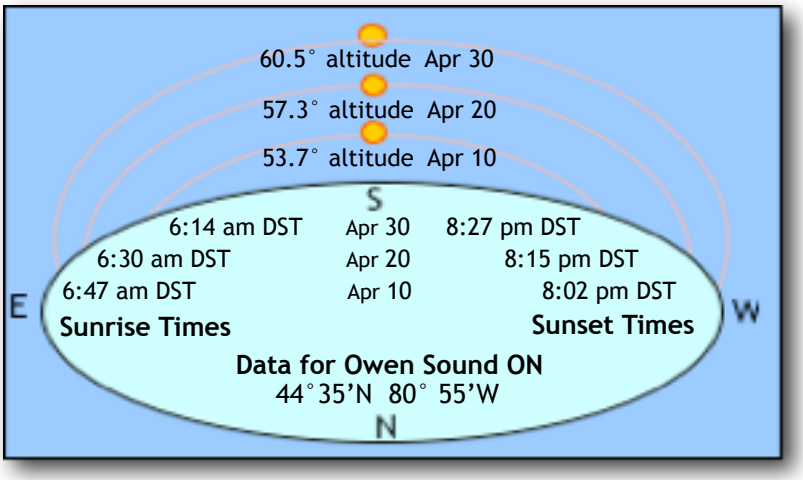
Mar 24	Sat	First Light for Webster 28 at ES Fox Obs
Apr 4	Wed	BAS Meeting Grey Roots 7:00 pm
Apr 14	Sat	Community Club Fair (displays), OS Library
Apr 21	**Sat**	**BAS Viewing Lyrid Meteors (20/h) peak**
		ES Fox Observatory time: dark
Apr 23 - 29		**International Astronomy Week**
Apr 24	Tue	Celebrate the Night Sky plus Sky Tour
		Grey Roots 7:30 pm
Apr 27	Fri	Coffin Ridge Winery public viewing session @dark
Apr 28	Sat	International Astronomy Day, Displays OS, PE
		9 am to noon Public Observing at ES Fox, evening
May 2	Wed	BAS Meeting Grey Roots 7:00 pm

Planets

SATURN is back!
Opposition Apr 15

MERCURY, is rising now before the sun above the eastern horizon, but it is not very high for northern observers. **VENUS**, (-4.6), passes M45 on Apr 3 (see Special Events) and moves up towards the tip of the horn of Taurus (Elnath) by month end. It is still climbing during the first week of May. The Crescent Moon is nearby on Apr 24 and 25. **MARS** fades from mag -0.7 to -0.2 in April and the disc shrinks to only 10.8" across at month end. It is closest to Regulus around Apr 13. **JUPITER**, (mag -2.0) is now setting in the west around 9 pm and by month end is lost in the glare near the sun. **SATURN**, (mag 0.2), is visible all night long and reaches opposition on Apr 15. Rings are tilted 13.6° mid-month. **URANUS**, (5.8) is close to the sun this month and comes close to Mercury on Apr 21. Both planets are in deep morning twilight. **NEPTUNE**, (7.9) rises in the east before sunrise and by month end it is in dark sky for an hour or so. Ceres now sets only an hour after the sun and is a difficult target as a result. **PLUTO** rises in the east by 2:30 am and may be found with accurate charts and large telescopes.

The diagram below gives the sunrise/sunset times and the sun's altitude on three dates this month. The calendar below the sun chart shows the moon phases for the month. Times of moonrise for NM, FQ, FM and LQ are in the Sky Calendar listing at left.



Special Events

Venus and the Pleiades

Venus encounters the Pleiades early in April. This is a repeat of an identical event in April of 2004 -both to the day and the path of Venus "through" M45! Venus moves through the handle of this tiniest of dippers from Apr 2 to Apr 4. The planet is, of course much closer to us than the Pleiades. Venus is only 5 light minutes from us, but the Pleiades light that is leaving this instant will not arrive until 2411 ! We are seeing M45 now by light that left there in 1611, about the same time that Galileo mapped this cluster in telescopic detail for the first time. Maybe the close approaches of Venus to M45 in 1609 or 1612 tweaked Galileo's interest in observe the cluster, we will never know.

Venus and the Pleiades come close to each other fairly regularly. You will have other opportunities to see this happen in 2015, 2018 and 2020, but don't let this April's chance go by. You have three days -one of them should be clear!

April 2012

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6 FM	7
8	9	10	11	12	13	14 LQ
15	16	17	18	19	20 NM	21
22	23	24	25	26	27 FQ	28
29	30					