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Dark Elysium?

By

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Mars observers have now been imaging the greatest volcanoes of the planet for many years, in a particular dimension: we do see relief effect on the images. Olympus Mons, Arsia, Ascraeus and Pavonis appear on some images as dark reddish spots, because they are huge enough to cast shadows that we can detect from Earth if the planet is observed near quadrature (Note 1). The shadow effect looks very strong and some images even look to reveal further relief details on the tormented floor of Tharsis.

As a consequence, it can be curious at first to note that another great martian mountain, the Elysium mons, do not appear as a dark spot on images. The topographical properties of Elysium of course explain the difference; but it is interesting to track the volcano on past images to find if ever it does have been detected, and if so, to find out how it presents itself on images.

Spacecraft imagery

The Mars Global Surveyor (MGS) probe gave splendid views of the relief of Mars. Figures 1 and 2 show Elysium Mons in comparison with Tharsis. Unlike these, Elysium, though a quite tall mountain (14 km above the surrounding plains), has a

reduced surface and a small conical shape. Just north of it, is a very similar old volcano: Hecates Tholus. We should pay attention to it as well because we will detect it frequently close to Elysium.

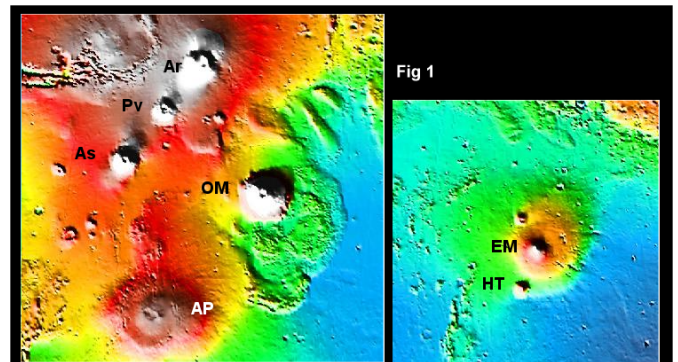
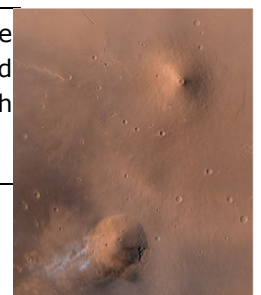


Figure 1: These are crops from the false-color MOLA (Mars Orbiter Laser Altimeter) images. They feature the martian relief with colors corresponding to the altitude (white=highest possible altitude). As we see Elysium (EM) and Hecates Tholus (HT) are much less impressive than the Tharsis volcanoes (Olympus Mons (OM), Ascraeus Mons (As), Pavonis Mons (P), Arsia Mons (Ar), and Alba Patera AP). South is up.

Figure 2: Color MGS image showing Elysium Mons (up) and Hecates Tholus (bottom). South is up.



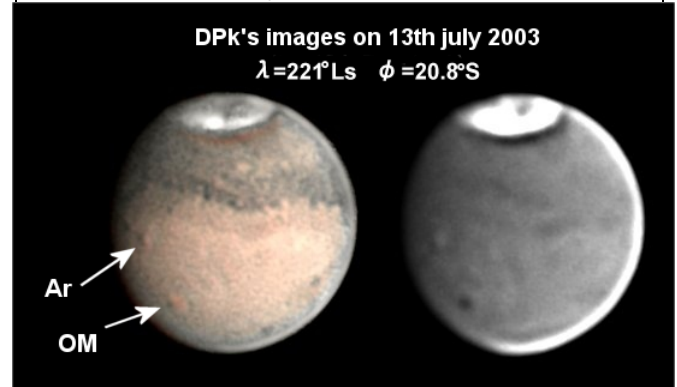
A bit of method

The best period to observe relief effect during a martian opposition is near quadrature, when the angle made by the Earth, Mars and the Sun is at its highest. Of course, at an elongation of 90° , the apparent diameter of the planet is still small during most of the apparitions except the closer ones. Looking back at the Great 2003 martian season, it's possible to track the relief effect on the Tharsis montes up to mid August, for a solar elongation of around 150° to 160° , and OM itself can be detected even closer to the opposition. Of course as Elysium and Hecates Tholus are much smaller volcanoes, we must expect a shorter favourable period of detection. In this respect a solar elongation from 100° to $130\text{--}140^\circ$ is probably good. This is also when the planet would be getting an apparent diameter comfortable enough for us to feed hope.

The Areocentric longitude of the Sun (Ls) range is also to be considered. Not all martian oppositions are equally interesting. In particular, orographic cloud activity above the volcanoes will largely ruin any effort to detect small, and subtle, ground details. So the best martian seasons are from northern fall to winter ($180\text{--}360^\circ\text{Ls}$), because these know dry climate conditions, as the greatest part of the water vapor is retained inside the then huge and thick northern polar hood. Crossing with the apparent size of the planet as seen from the Earth, we easily find that perihelical apparitions (with the first aphelical occurring in December, around the martian vernal equinox 000°Ls) are the best ones.

If we expect a similar behavior on the images to Tharsis montes, then we must look for dark points, possibly reddish, because this is the exact color of Tharsis montes as recorded on images. A good tip of control would be to look at the B images alone; red implies strong absorption in blue, so the points could be enhanced in short wavelengths. This is again induced by Tharsis photographic data (see Fig 3):

2003 show very well relief structures in Tharsis near terminator. Arsia Mons (Ar) and Olympus Mons (OM) are clear dark-reddish points in RGB ; in blue light, OM is the darkest feature of the whole disk, because the shadowy part is darkly red. The solar elongation is 132°W and the apparent diameter reaches $18,9''$.



A good method would also be to look for shadow variation with the martian hour. The putative dark point must get darker and darker as the Sun is running toward the horizon. However, due to the expected small size of our targets, and because the environment of the two has more dark albedo details than in Tharsis, the probability that we can effectively detect this variation on images looks weak.

The last point to consider is how we should image the planet to detect the volcanoes. As a surface detail, they would be nicely shot in red light. Due to the fact that we're only looking for them under very good to excellent seeing, IR imaging does not look interesting because we absolutely can't lose resolution (and IR is superior to red light in this respect only if seeing is poor). A visible R filter (such as Astronomik for example) will be preferred to any long pass IR or R+IR filter. However, we should as well consider true-color images accompanied by their B component (RGB or true LRGB), because we are also willing to collect color information.

Earth-based professional instrument results

Some images taken with professional instruments bring interesting data. The Hubble Space Telescope clearly imaged the two summits in 1995, as well as Jean-Luc Dauvergne and François Colas at the Pic du Midi in November 2007 (Fig 4). Both images

Figure 3: These images taken by Don Parker in

show clearly the summits as two relief points.

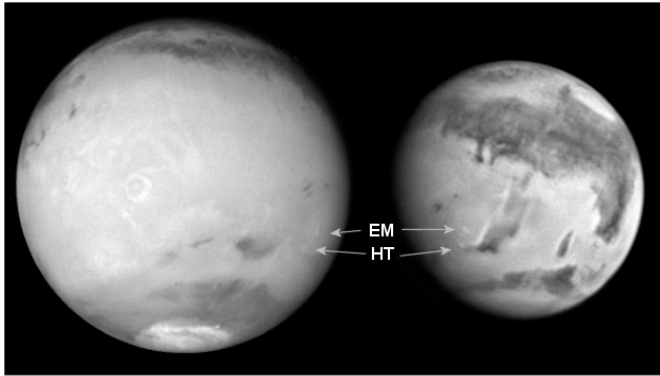


Figure 4: Images of Elysium Mons (EM) and Hecates Tholus (HT) taken by the HST (*left*: 25 February 1995 with F673N filter - Ls 64°, CM 152°) and at the T1M of the Pic du Midi (*right*: 18 November 2007 with IR 850 filter - 349°Ls, CM 236°W). We can see how small EM and HT are in comparison with the Tharsis volcanoes that also show up in the 1995 HST view.

Images © STScI and © IMCCE/S2p/OMP/Jean-Luc Dauvergne/François Colas.

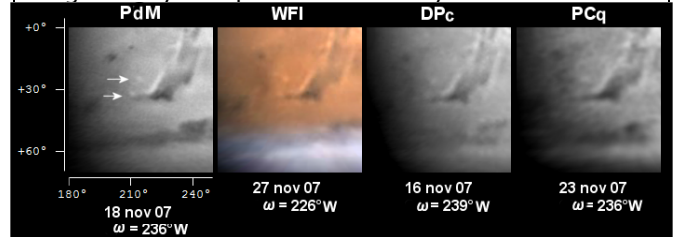
A review of amateur images over the last apparitions

The 2007 apparition has given the best candidates. The image taken at the Pic du Midi is made of gold for us because it compares very well with some amateur images of the same period, and clearly shows how the two summits much look like. The results are presented on Fig 5.

Figure 5: Crops of WinJupos maps made with images from Bill FLANAGAN (WFI), Damian PEACH (DPc) and Paulo CASQUINHA (PCq) in comparison with the Pic du Midi image (PdM). All images are taken within ten days from this last one and around the same central meridian. Ls range is 348°Ls to 354°Ls, and solar elongation went from 133° to 143°.

The image from WFI is quite convincing and pretends to show the same appearance of the two summits, with a bright sunlit side to the west (right) and a shadowy side at the opposite. DPc will show the same although the image is a bit less clear; however the LCM is not the same and the volcanoes are advancing towards the evening light fading. PCq's image is also a good candidate but the image is a bit less sharp (the original image looks more reliable). DPc and PCq are R images; the reason why to chose a color image from WFI is because this observer is using the true LRGB method; his color composites

are generally sharper than his R layers alone.



Damian Peach took a long series of relevant red images on November 16th from 00H22 UT to 03H04 UT (plus RGB, G, B). The temptation to see on these frames a regular evolution on the aspect of Elysium and Hecates Tholus exists, although it would be necessary to subtract seeing effects or processing variations. Quite bright on the first frame, the two summits would darken on the following frames. See Fig 6.

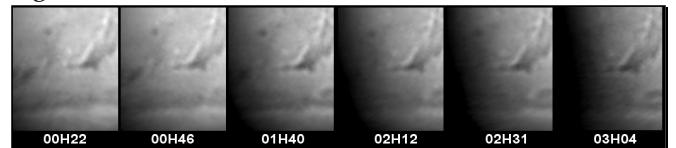


Figure 6: DPc's R series on 16th November 2007 (time in UT). Poll: who sees a relief variation, and who doesn't ?

The preceding apparitions are more disappointing. Although the planet had a bigger apparent size, candidates look less interesting. In 2003, conditions were theoretically excellent - although the planet was low in the sky for most observers in the terrestrial northern hemisphere. But the quality of amateur images was not as good as it was going to be a few years later (Note 2). One image taken by Eric NG (ENg) in Hong-Kong is provocative, but is taken at opposition. See for yourself in Fig 7.

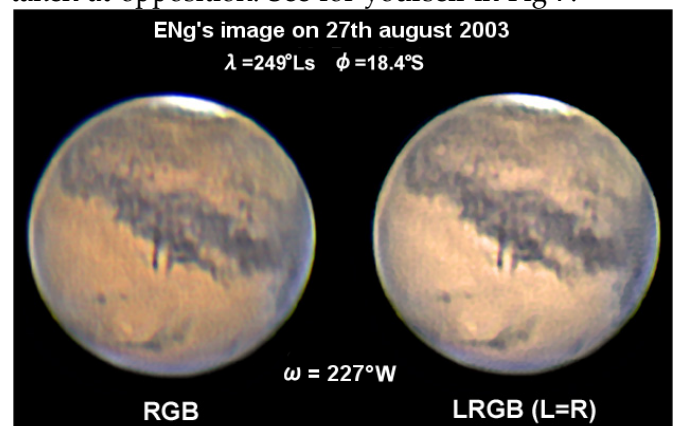


Figure 7: In this image taken in 2003 by Eric NG we are tempted to see Elysium as a relief point (the

color image is at left, at right is an R image colorised where ground details show up). But the theoretical frame is not respected because the image is taken almost exactly at opposition (28th August). However, the summit is located far into the northern hemisphere while the Sun is lightening the southern hemisphere, so it's still quite close to the limb. We are not supposed to see shadows at opposition... but the declination of the Sun ($D_s = -23^\circ$) was quite different from the declination of the Earth ($D_e = -18,4^\circ$), so in pure theory it would allow us to see shadows in that region. Eventually, the summit looks reddish in the RGB image; but the B layer of the ToUcam Pro is of no help to verify. This has been taken while the apparent diameter was beyond 25 arcseconds.

Next comes the 2005 apparition. Despite the smaller apparent diameter (although still very favourable), we would expect better results, at least because the cameras were much more performing than in 2003 (Note 3). In figure 8 two images taken by DPc and Ed GRAFTON possibly show Elysium as a dark feature, although Hecates Tholus is already too much into the incoming nightside.

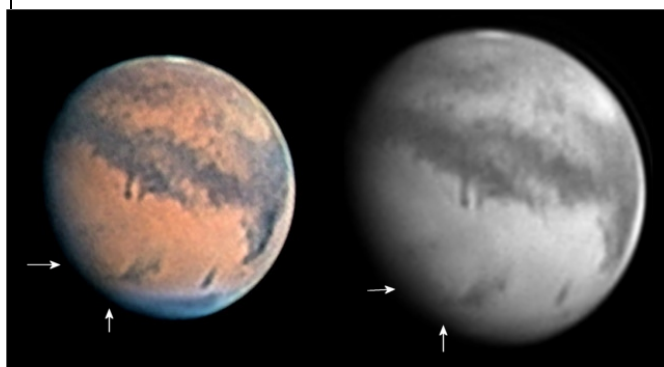


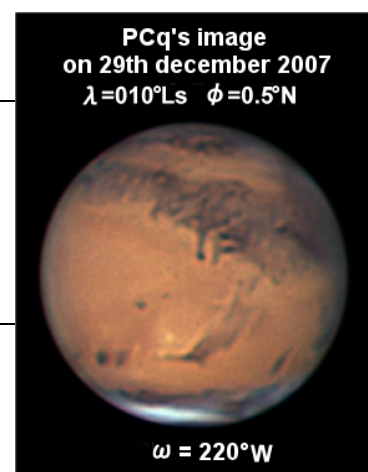
Figure 8: Images taken during the 2005 apparition. *Left:* taken by Ed GRAFTON on 1st October 2005 (298°Ls, LCM 236°W, solar elongation 136°). The image is made with a luminance excluding blue wavelengths. *Right:* red image by DPc on Sept. 20th (291°Ls, LCM 228°W, solar elongation 125°).

No candidate have been found for the 2001 apparition. Amateur resolution was quite less good than it was about to get on the following years; of course the great dust storm did not helped at all during the second half! For the last 2009-2010 apparition, orographic cloud activity prevented possible successful images (the apparent diameter was certainly too small as well).

Bright Elysium

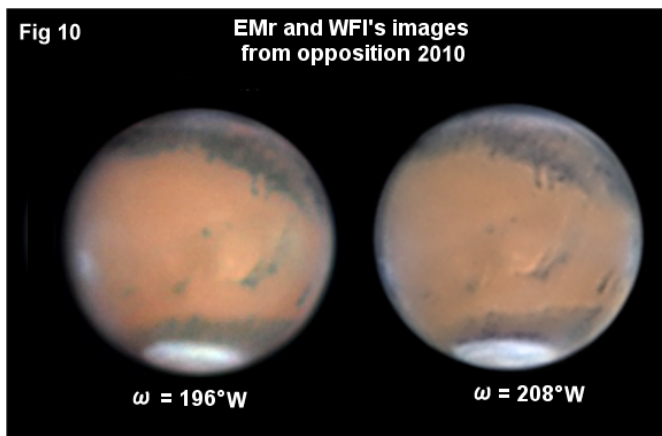
The review of amateur images leads to another element. It's recognized that during the opposition time, some martian reliefs are going to shine, as seen from Earth, when they reflect the sunlight toward our direction if a given slope, for example, is correctly orientated. This was outstanding for the Tharsis volcanoes in 2005. Elysium and Hecates Tholus do shine as well and to the contrary of Tharsis, this is the best time to detect them. Medium-sized telescope would be able to catch this. Figure 9 features a near-opposition image from 2007.

Figure 9: Image by Paulo CASQUINHA, showing shiny Elysium and Hecates in RGB close to opposition day (24 December).



The bright Elysium phenomenon, however, shows a variation from opposition to opposition. During the time of opposition in late January 2010, it has been very difficult to find images showing this; two have been found where the summits are shining dimly in comparison with CASQUINHA's 2007 view (see Fig 10) - and this, on sols where orographic activity looked very weak, if not absent (at least during noon). Other images even taken with big diameter do not show anything at all. It looks logical to say that the declination of the Earth was unfavourable: the flanks of the volcanoes were not inclined toward us as they were in the preceding apparitions. By the way, the brighter effect has been found during opposition 2007 (with $D_e = 0$ to 1°), unlike the Tharsis volcanoes that were fire burning in 2005, but not in any other apparition (Note 4).

Figure 10: « Bright » Elysium and Hecatus, but dimmer, during opposition 2010. *Left:* RGB image by Efrain MORALES(EMr) on 21st January ($\lambda = 041^\circ$ Ls; $\phi = 16^\circ$ N), and at *right:* LRGB from Bill FLANAGAN (WFI) on the following day (same Ls and ϕ).



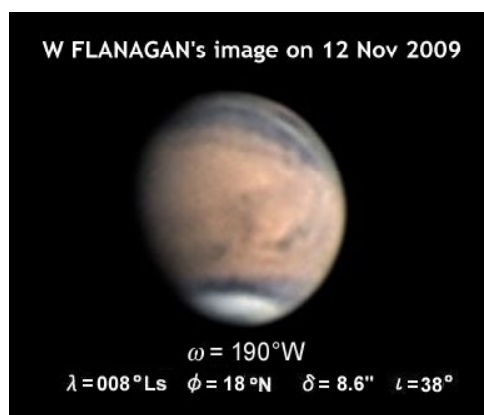
In conclusion, only fair evidences of the detection of shadows from the Elysium Mons and Hecates Tholus have been found. The best evidence of relief effect, unlike Tharsis, is brought by the variation of brightness, not by the appearance of shadows. So we might call it « bright Elysium » instead !

The following apparitions look quite unfavourable to see this. The apparent diameter will remain small until 2016, the orographic activity will increase to

CMO 09/10 Mars Note (16)

Morning Hesperia Cloud *Shot by Bill FLANAGAN*

On a series of attractive images produced by Bill FLANAGAN (WFI) on 11, 12, 13 November 2009, an interesting cloud over Hesperia



is shot which cannot be overlooked. Since it was still $\iota=38^\circ$, it is not truly at the morning limb, it

appears finer bounded by the dark morning M Tyrrhenum and the preceding M Cimmerium. The cloud is along Hesperia and its east looks extended to Eridania. Apparent diameter δ was still at the stage of 8.5"-8.6", while the images are all excellent. The Martian season was around $\lambda=008^\circ\text{Ls}\sim009^\circ\text{Ls}$

reach its maximum during the martian boreal summer, and the declination of Earth will not be the good one... we are going to wait quite a few years.

Notes:

(1) The reader can refer to the 11th CMO 2009/10 Note, *Big Volcanoes on Mars When the Phase Angle is Large*, M. MINAMI, CMO #383.

(2) In 2003 the most widely used camera was the ToUcam Pro color webcam, before any of the future modifications. Despite the great jump in image quality at the time, with the time it looks insufficient for the quality required here.

(3) The 2005 apparition saw the widespreading of b&w cameras. Most of them were webcams modified to produce raw images («raw mode»), a level of quality already several grades above that of the non modified Toucam Pro. But some amateurs' were also using the next generation of cameras with the introduction that year of the Lumenera LU075M.

(4) The HST produced images on the day of opposition (6th November 2005) where the two summits look very shiny. However the scale of quality is not the same; amateurs images taken on the same day do not show them as well as in 2007.

and perhaps this phenomenon depends on the season (beginning of the southern autumnal equinox) but it may be not so easy to encounter the occasion.

Data of the images are given by

11 Nov 2009 ($\lambda=008^\circ\text{Ls}$) at $\omega=199^\circ\text{W}$, 204°W
<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2009/091111/WFI11Nov09.jpg>

12 Nov 2009 ($\lambda=008^\circ\text{Ls}$) at $\omega=190^\circ\text{W}$, 192°W
<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2009/091112/WFI12Nov09.jpg>

13 Nov 2009 ($\lambda=009^\circ\text{Ls}$) at $\omega=180^\circ\text{W}$, 183°W , 185°W
<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2009/091113/WFI13Nov09.jpg>

which all show the cloud belt. Unfortunately the B images do not particularly inform any concrete data, but we may say this kind of cloud belongs to the white cloud. Above we have shown the image made on 12 Nov at $\omega=190^\circ\text{W}$. It is notable that M Tyrrhenum looks dark to show up the cloud, and hence meteorologically it must be more important that M Tyrrhenum was not covered by the morning cloud.

Among Hesperia, Amenthes Planum is a lower Planum and so this is the place always to be noticed, but in this case we should say the cloud stays along the whole Hesperia up until rather the higher Eridania direction. (M MINAMI)

CMO 09/10 Mars Note (17)

Bright Streak between Deuteronilus and M Acidalium

Frequently the belt between Deuteronilus and M Acidalium appears very bright and sometime it has been misunderstood as a dust stream. However it is often ground-lit and less dusty: The example here we pick out is an image set of Don PARKER (DPK) from 15 Mar 2010 ($\lambda=064^\circ\text{Ls}$) at $\omega=017^\circ\text{W}$ in which its B image shows a white streak so that it is associate with the water vapour. DPK's images were taken when $\delta=10.7''$, but they are excellent. Its whole image set can be seen from

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2009/100315/DPk15Mar10.jpg> while we shall show here R and B images side by



side. The white mist in B shows that it enters the area of Achillis Pons. Note that this is not so near the morning area. We hope every observer tries to take a good B image every time. (M MINAMI)

CMO 09/10 Mars Note (18)

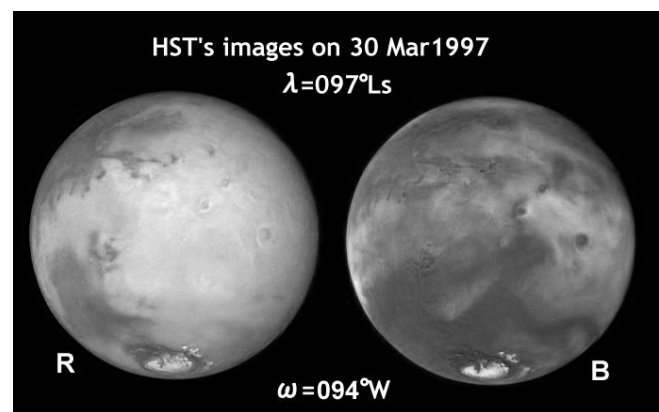
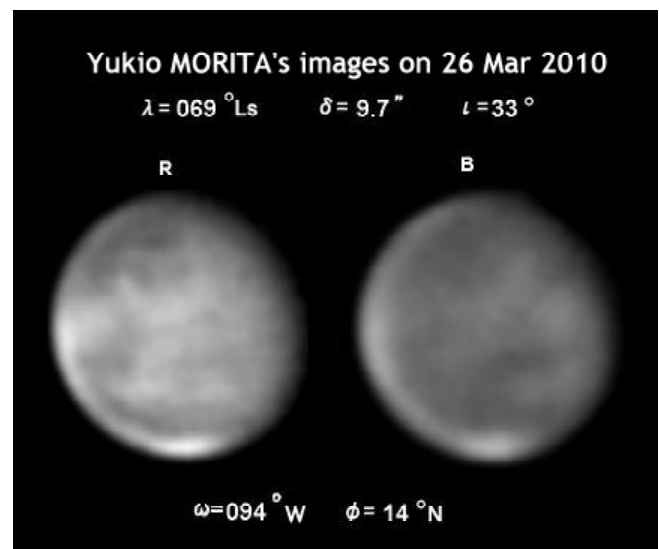
Wine-Coloured Tharsis to Arcadia

Yukio MORITA (Mo) produced a B image where the area of Tharsis to Arcadia is nor-

mally dark on 26 Mar 2010 ($\lambda=069^\circ\text{Ls}$) at $\omega=094^\circ\text{W}$: <http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2009/100326/Mo26Mar10.jpg> This is conspicuous because the area of Tharsis Montes are covered by the white morning mist. This dark area in B is original and cannot be seen in R and even in G. Hence the colour composition shows this area in a wine-coloured one.

This fact was once (or twice) touched for example in CMO #211 (Jan 1999):

<http://www.hida.kyoto-u.ac.jp/~cmo/cmomn0/97Note14.htm> where some decomposition of HST's image on 30 Mar 1997 ($\lambda=097^\circ\text{Ls}$) at $\omega=094^\circ\text{W}$. Mo trapped the fact slightly earlier in season and here we compare.



In the next apparition one should be careful about these angles with elaborated B images.

(M MINAMI)

Letters to the Editor

●.....Subject: Transit of Venus Project searches for an author

Received: Tue 19 July 2011 17:19:04 JST

Dear Masatsugu Minami, You already might have looked into the international Transit of Venus Project's website, launched about two months ago to get

people involved in the observation of the next transit of Venus in June 2012:

<http://www.transitofvenus.nl>

The website offers background information, and projects and activities you can join in to. On the home page, blog posts concerning the transit are being published regularly by a varied team of authors: Chuck Bueter (educator), Randall Rosenfeld (archivist of RASC), Andrea Wulf (writer), Michael Zeiler (cartographer), Nandivada Rathnasree (director of New Delhi Planetarium), Paolo Tanga (planetary scientist) and myself (high school physics teacher).

Yet, I feel that a voice from Japan is still missing, whereas the Japan has a lot to offer if it comes to the 2012 transit of Venus: an interesting history (1874, 1882), and "most importantly" the entire transit will be visible from this part of the globe in 2012. I expect a great many observers will travel to Japan in 2012 just to watch the transit of Venus!

I wondered if you would like to consider writing short blog posts for our website on a voluntary basis with a frequency of, say, twice a month. Subjects may range from historical stories of the transit, accounts of the 2004 transit, ideas for educational activities to tips for organising public observing sessions as long as it has to do with the transit of Venus. You may go through the current blog posts to see what has been published so far. I would be very happy to add you to our team of authors! I look forward to hearing from you. Best regards,

Steven van ROODE (Breda, the Netherlands)

⌘.....**Subject: Re: Pseudo-relief-like images of Tharsis Montes**
Received: Sun 24 July 2011 01:33:01 JST

Dear Reiichi, I'm making an answer to you quite a long time after this message, but I'm actually fully working on the note so I'm re-investigating all our correspondence. I think on my part that the 3D effect is real, is really an image of a shadowy side with a sunlit side of the volcanoes. The final proof of that is that we can detect from the Earth, on amateur images, the progressive darkening of the shadowy parts with the our (we can also see this on

"Valhalla"). It can of course, be artificially enhanced by strong processing, but is not really what I would call an artefact.

>Besides indicating Arsia Mons, the green arrows are intended to point the delicate notches on the limbs just over the volcano. In the 2003 CMO Mars Gallery, on some images taken in the period around the opposition day, extremely conspicuous dark spots are recorded on the morning limbs just over Arsia Mons ; some examples are on the images of:

Don PARKER 25 Aug 2003 04:17GMT $\omega=058^\circ\text{W}$

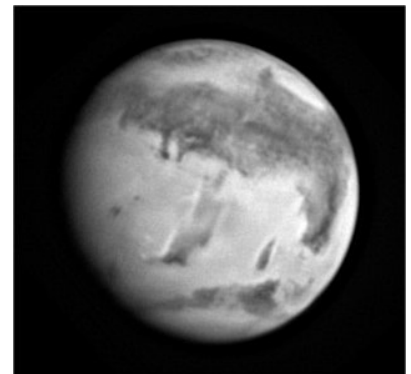
George HALL 29 Aug 06:30GMT $\omega=056^\circ\text{W}$

Ed GRAFTON 29 Aug 06:47GMT $\omega=059^\circ\text{W}$...

Were the dark spots other Föhn Phenomena!?

Oh that's really interesting. This very dark line was absolutely intriguing at the time... but we will note that it's darker in red light. It should be less contrasted in red light? Hall and Grafton are respectively RRGB and R/IR-RGB processing, the ones that eliminate strongly the atmosphere on (pseudo) color images. Yet it still shows up contrasty.

Back to the note, I have re-processed the Pic image and I have done well (see attached). Thanks



to it, it's much easier to detect Elysium and Hecatus on amateur images. In 2007, I have three successful amateurs (Peach, Casquinha, Flanagan). Some in 2003 as well... Best wishes,

○.....**Subject: Re: Real Relief Image**
Received: Sat 30 July 2011 00:09:16 JST

Dear Reiichi, Great simulation ;-)). I like once to play with styrofoam spheres for painting globes of Mars. I had one nicely done: check some



photos here! I do not have it anymore.
After a

few years the paint was getting destroyed. And of course I have no time any more to make a new one... best wishes

○.....**Subject: Re: A Real Mars Globe**

Received: Sun 31 July 2011 01:44:45 JST

Dear Reiichi, Yes it was quite fun because I could "simulate" every view I wanted! It was painted in 2002; at the time I had not witnessed any perihelic apparitions but the intermediate 2001 one (a bit too young to really observe in 1986-88-90) and I had almost only observe the northern hemisphere of Mars. I was eager to anticipate the change of geometry; The markings are those prior to the 2001 global storm (I had mainly painted it from MGS data and HST photos).

Yes Hellas and Alba Mons are at the opposite... I heard once the idea that the Tharsis bulge burst because something had penetrated deeply into the planet from the opposite side, leaving an enormous scar - Hellas. Don't know if this is possible... Best,

○.....**Subject: ISMO 288 draft**

Received: Mon 1 Aug 2011 01:29:18 JST

Dear Reiichi, dear Masatsugu, Please find attached the developed draft for the Elysium note. The figures are in the zipped file as well as in the text. The conclusions were a bit changed since the first summary draft, as I propose some relevant images for a possible detection of a relief effect on amateur images. I have not included every aspect we have been sharing since two months by e-mail; please add anything you find interesting. Especially, a word about the "non-poking" aspect beneath morning mist must be included I think... I did not find any example either on HST data (and I have a lot). About the aspect during the 2001 dust storm; I have attached a pdf complete article from Wang, Toigo and Strausberg where you will find good MGS images. On figure 9 (page 19) we can see EM and HT darkened by the storm, I think; the dark Tharsis volcanoes show up very well on the same images. Best wishes,

Le 31/07/2011 10:47, Masatsugu MINAMI a écrit :

> Dear Christophe and Rei-ichi,
> I am reading the correspondences between you with
> interest. How about the problem about Elysium

> thereafter? We hope you have already gotten nice
> points and will finish the essay and send it
> to us by 10 August.
>
> As to Christophe's first question whether we can
> find the dark caldera of Elysium Mons poking out of
> the morning mist, we have also sometimes looked
> for, but have failed. A nice morning mist over
> Elysium is found on the images produced on 3 April
> 2010 by SWk and DPK (072 degrees Ls) whereas the
> dark spot cannot be visible. Was the mist thick or
> higher? However its caldera is smaller (about 14 km
> in diameter) and must look different from those at
> Tharsis, and hence it may be hard to detect the dark
> spot, while the bright spot of the caldera is
> frequently caught.
>
> On the other hand a faint SN-directed shadowy
> central zigzagged segment on the classical Elysium
> is seen for example on the images of WFI on 11, 12,
> and 13 November 2009. This was also more vivid
> when the 2001 yellow cloud covered the area: For
> example see Mo (MORITA)'s IR images on 2 July
> 2001. As far as I see this may be related with the
> ridge of Montes inside Elysium under the thin dust
> covering. (In the case of Olympus Mons and
> others, their calderas were clearly dark poking out
> of the dust
> - already seen at Okinawa from around 6 July 2001).
>
> The interesting images of the EAS provided by
> Rei-ichi are showing Elysium Mons, but I cannot
> distinguish whether its dark point is related with the
> caldera or the upper flank. Does Elysium Mons have
> really a well deep caldera?
>
> Anyway I hope you will put forward some good
> answers to my primitive questions.
>
> By the way, Rei-ichi, do you think the morning
> shadow near Arsia Mons shot by My (MIYAZAKI)
> on 30 September 1988 is the shadow of Arsia Mons
> while the phase angle is very small? Refer to the
> photo by My cited at page Ser2-0602 in
> <http://www.hida.kyoto-u.ac.jp/~cmo/cmomn3/CMO330.pdf>
> At any rate I look forward to receiving your
> photos/drawings to be cited by 10 August.
> With best wishes,
> **Masatsugu**

○.....**Subject: Re: Elysium image**

Received: Tue 2 Aug 2011 06:27:24 JST

Dear Reiichi, I had seen the two HST images that you refer to but did not retain them. For the 3rd may 1997, the summits look just outside the mist for me; and for the Feb. 95 image, I think that we just see Elysium through the mist, note above the mist. I mean that it's faint and that we just see the ground by transparence...

The Elysium region produces much less mist than

Tharsis, if do not say silly things, and is located further to the north, so it's generally free from the influence of the equatorial cloud belt observed during perihelical apparitions. We may just lack situations where we would be able to decide if it's able to poke or not.

Now about Don's image, I just sincerely do not see the two Mons on it...

Masatsugu: thanks for your notification of publication! Best wishes,

○.....**Subject: Re: PDF of your Essay in #388**
Received: Sun 7 Aug 2011 03:06:52 JST

Dear Masatsugu, Very fine! Here is just two remarks on my side:

- Legend of figure 4: Hecates and non Hecatus (my mistake) idem on Fig 9
- Figure 10: "2010" apparition, not "2007"

Best wishes,

Christophe PELLIER (Nantes, France)

●.....**Subject: Real Relief Image**
Received: Mon 25 July 2011 00:14:20 JST

Dear Christophe, You are absolutely right in interpreting the relief-like images of Tharsis Montes and Elysium Volcanoes...they are indeed real relief images:

I carried out a simple primitive simulation to test how huge Martian low-profile volcanic mounds



look near the limb in near opposition period:

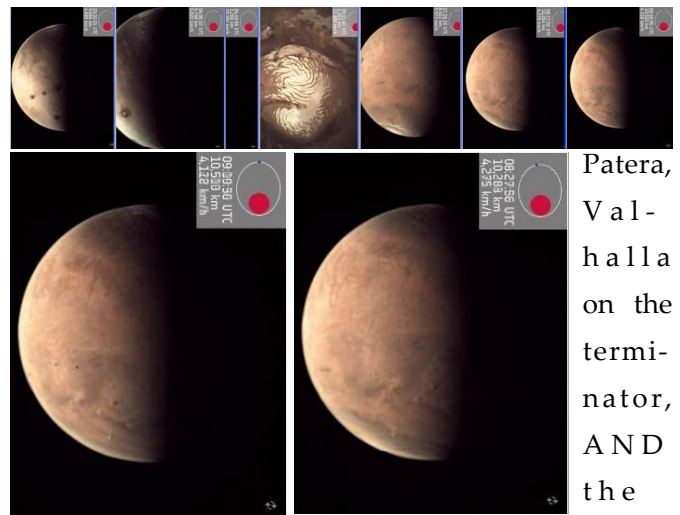
An equal-proportion "Olympus Mons" was made with white clay on a styrofoam sphere of 15cm across. Then the sphere was lit with a collimated light beam with "the volcano" located near the terminator. And it was photographed at two different angles to make a half-Mars shot and a full-Mars one

respectively (attaching here). The result needs no explanation, it shows a real relief image of a shadowy side with a sunlit side of the mound just as you pointed out. The low-profile seems to be the point; A steeper peak enough to cast long shadow will result in "shadow hiding" by the peak itself to render it non-3D appearance in the vicinity of near opposition limb.

Also attached here are very interesting images captured from the ESA Mars Express's animation:

http://www.esa.int/export/SPECIALS/Mars_Express/SEMOR15XT9G_0.html

You can see many many familiar features in this animation; Tharsis Montes, Argyre, Douglass & Lowell craters, NPC close-up, shadowed Apolinaris



shadowed Elysium Volcanoes coming out from the dawn terminator! Dashing Phobos and its shadow also! Best Wishes

PS: In your latest email, your voice calling for visual observing wasn't subtle for me, flooded between the lines!

○.....**Subject: A Real Mars Globe**
Received : Sun 31 July 2011 00:29:30 JST

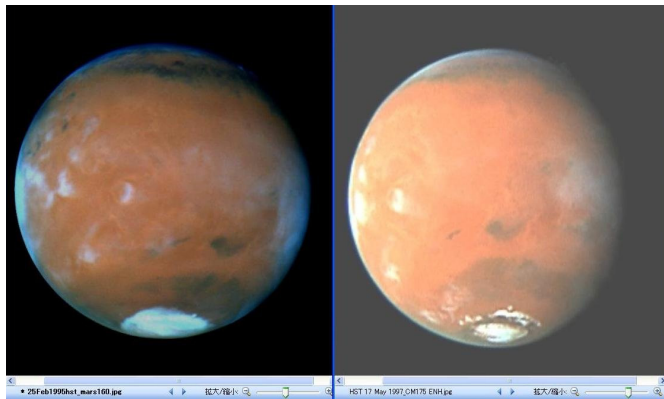
Dear Christophe, What a fantastic real Mars globe, and how sad to hear the paint was finally ruined! I guess you already have many virtual Mars globes of various apparitions in your PC, but I believe the old real globe of your own painting which you could have been holding in your hands gave you a lot of special fun.

I myself have several ready-made Mars globes. Next door to us is a cozy pub (our home/clinic is in the midst of our town's combat zone, once the bot-

tle of sake as well as my smallest 12cm across Mars red-light district) where I keep my own personal globe. It's great fun drinking at the corner seat (almost for my exclusive use) with my globe...I noticed on it the other day that Hellas Planitia and Alba Mons form perfect antipodes! I hope I can enjoy my sake sometime with a Mars globe of my own painting! Best Wishes,

○.....*Subject: Draft for the note on Elysium*
Received: Mon 1 Aug 2011 16:52:22 JST

Dear Christophe, Great draft; I think it's almost the time to say "Let's go!"



As to "Non-Poking EM beneath the morning mist you mentioned, how about these? (find attached).

Best,

○.....*Subject: Elysium image*
Received: Mon 1 Aug 2011 21:18:43 JST

Dear Christophe, Just after I had sent my latest email to you, I noticed that the left-side image attached was the same as the left-hand one in your draft's Fig.4! And on the 3 Apr 2010 image by DPK which Dr. Minami pointed out in his latest email to us, I think relief (like) EM image can be seen through the morning mist (please check attached enhanced image).

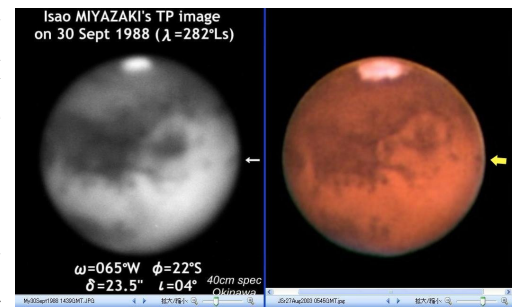
The reason we can't find the image of dark EM poking out of the morning mist may be...the mist appearing over Elysium area may be thick or high, EM is not so high (already on the Elysium Rise of relatively small extent), or the flank and the



caldera of EM may be not so dark as Tharsis cousins, etc.... Best,

○.....*Subject: Dark Segment west of Arsia Mons*
Received: Thu 11 Aug 2011 19:43:15 JST

Dear Dr. Minami, In response to your question in your email on 31 July, I reviewed Isao MIYAZAKI (My)'s TP shot on 30 Sept 1988 14:39 GMT ($\omega=065^\circ\text{W}$, $\lambda=282^\circ\text{Ls}$, $\phi=22^\circ\text{S}$, $\delta=23.5''$, $\iota=04^\circ$, with a 40cm Newtonian). The dark segment following Arsia Mons at the dawn terminator was right there. In the 2003 Mars Gallery, I found an image taken on a near-opposition day with almost the same CM as My's 1988 photo; the image by Jose SURO on 27 Aug 2003 05:45 GMT ($\omega=063^\circ\text{W}$, $\lambda=249^\circ\text{Ls}$, $\phi=19^\circ\text{S}$, $\delta=25.1''$, $\iota=05^\circ$, with a 28cm SCT) looks to show exactly the same phenomenon as recorded on My's shot. Taking their locations and extents into account, they were not, I think, the huge volcano's shadowy reliefs at



opposition à la Christophe PELLIER. They might have been caused by some other meteorological process, like the one you have proposed in CMO 2005 Mars Note (13) in CMO #330...possible morning side Föhn phenomenon over Arsia Mons. Is the phenomenon not so rare in Martian southern summer? Good Seeing with Excellent Scopes!

○.....*Subject: Dark segments following Arsia Mons*
Received: Sat 13 Aug 2011 12:48:01 JST

Dear Dr. Minami, While I was wandering through the Web last night, I have stumbled across a drawing of Mars by Prof. Shotaro MIYAMOTO on 1 Sept 1971 which may show a dark segment near the dawn terminator, west of Arsia Mons. CM was almost the same as those of the images by Isao MIYAZAKI and Jose SURO which I have mentioned in my latest LtE, and the season might have been around that with $\lambda=245^\circ\text{Ls}$. Was that a same phenomenon as recorded in 1988 and 2003? (though possibly the shadowy Arsia Mons itself because

the drawing was taken some twenty days after the opposition day). If that was the case, then we can say we already know the probably meteorological phenomena occurred in this three consecutive major Martian oppositions. I am also reviewing the drawings by Japanese observers in 1956 apparition.

Good Seeing with Excellent Scopes!

Reiichi KONNAI (Fukushima, Japan)

●.....*Subject: Apology for calling someone an idiot*
Received: Mon 25 July 2011 03:41:02 JST

Dear Masatsugu, Please, in response to Sam Whitby's comment in the latest CMO, accept my apology for calling someone an idiot in a previous (hot-headed) correspondence. Doing so was an idiotic thing for me to do, and I do regret it. Sincerely,

○.....*Subject: Re: Lafcadio HEARN*
Received: Sat 6 Aug 2011 10:27:04 JST

Tanabata_Festival_in_Edo_(Hiroshige,_1852).jpg

Dear Masatsugu,

I will try to write something on Hearn, though as you guessed, I am really busy--

I do know of the festival day you speak of (Tanabata) and even referred to



it in my Milky Way book that will be published soon. I will think of it. (Do you mean July 7, which has passed, or August 7 which is still to come?)

Here is an attachment. Best,

○.....*Subject: Re: Tanabata*
Received: Sun 7 Aug 2011 00:50:48 JST

Dear Masatsugu, In the Galaxies book (my Guggenheim 2001 project which has now been an off and on thing for ten years), I write the following passage, which I hope you will peruse for accuracy.

I will try later today or tomorrow to jot a page or two about Lafcadio Hearn. Best wishes,

Even from the northern hemisphere, the Milky Way, seen

from a clear dark site, exhilarates with its magnificence. One northern hemisphere witness to its grandeur, the Japanese haiku writer and pilgrim Basho, (1644-94) looked across the sea to Sado Island, where political exiles were confined, and exclaimed:

*High over wild seas,
 Surrounding Sado Island --
 The River of Heaven!* [i] <#_edn1>

Basho wrote that haiku on the eve of Tanabata Matsuri (the "Evening of the Seventh"), a Japanese summer star-festival celebrating the reunion (for one night) of Orihime and Hikoboshi, represented by the stars Vega and Altair. According to a legend originally imported into Japan from China, these personalities were separated from one another by the river Amanogawa (literally, the "heavenly river," i.e., the Milky Way) but are permitted to meet again for one night a year (on the seventh day of the seventh lunar month of the lunisolar calendar). [ii] <#_edn2>

For the Northern Hemisphere lover of galactic wonders, the separation is not by but from the Milky Way or at any rate, from some of its most brilliant aspects. As the Galactic Center, in Sagittarius, lies at 20 degrees south latitude, only from places south of the equator can the lover embrace many of the most gleaming objects of his (or her) desire.

Travel to Chile, to South Africa, to Australia, to New Zealand. Let it be during the northern summer, which also happens to be the southern winter; not the time that most pale-faced sun-worshippers disembark for southern latin northern cities but well worth the journey. It is a worthy pilgrimage for the star-lover. Again Basho's words are brought to mind:

Here one is almost overcome by the sense of intense feminine beauty in a shining world. It must have been the mountain god Oya Mozumi who made this place. And whose words or brush could adequately describe a world so divinely inspired? [iii] <#_edn3>

[i] <#_ednref> Matsuo Basho, *Narrow Road to the Interior and other Writings*; trans. Sam Hamill. Boston and London: Shambala, 2000, p. 29.

[ii] <#_ednref> For a classic recounting, see Lafcadio Hearn, *The Romance of the Milky Way*, and other studies and stories (Boston: Houghton Mifflin & Co., 1905).

[iii] <#_ednref> Basho, *Narrow Road*, p. 17.

○.....*Subject: RE: Lafcadio HEARN*
Received: Tue 9 Aug 2011 22:51:02 JST

Dear Masatsugu, Still mulling over the Lafcadio Hearn essay--but meanwhile I will respond to the question about the Basho quote (or rather misquote).

The full passage reads: "Sun overhead before we left the shrine, we hired a boat to cross to Matsushima, a mile or more away. We disembarked on Ojima Beach..." This then is the place where he finds inspiration of the feminine beauty in a shining world; and refers to the mountain god Oyamazumi (I misquoted!) as having made it. Best,

○.....*Subject: Re: Matsushima*
Received: Thu 11 Aug 2011 06:32:37 JST

Dear Masatsugu,

I think that it would be a lovely place to see the Milky Way from.

On 10 Aug 2011 at 19:03 JST, "Masatsugu MINAMI" wrote:

> Dear Bill,
 > As far as I understand, Matsushima has nothing to
 > do with the night sky or Amanogawa. Basho really
 > saw Amanogawa near Sado on 7 July (Lunar
 > Calendar), but Sado is located at the Japan Sea
 > (quite near Nawoetsu we visited) whereas
 > Matsushima is facing to the Pacific Ocean (opposite
 > side). Too far. Matsushima is famous with the beauty
 > of many small pine tree islands (nearly 260:
 > Matsu=pine, shima=island), and its beauty is
 > compared with the famous beautiful lady Sei-shi
 > (Xi-Shi) in China and I suppose this is not related
 > with the story of the Ginga (Amanogawa). So I
 > cannot understand why Matsushima appears in your
 > galaxy book.
 > With best wishes,
 > **Masatsugu**

●.....Subject: Re: Edward Emerson Barnard Papers have been processed

Received: Thu 11 Aug 2011 07:59:59 JST

forwarded message:
 From: Barbara Kern
 Date: April 8, 2011 12:37:01 PM CDT
 Subject: [Aac_all] LIBRARY: Edward Emerson Barnard
 Papers have been processed

All, I am pleased to let you know that the Edward Emerson Barnard Papers that were transferred from Yerkes Observatory to the Special Collections Research Center have now been processed and appear in the Archives and Manuscripts finding aids database:

<http://ead.lib.uchicago.edu>

Interestingly, the Barnard Papers included 16 notebooks of observations and calculations from Philip Fox, who worked briefly at Yerkes before becoming director of Northwestern's Dearborn Observatory, and the first director of the Adler Planetarium. The Fox notebooks were made into a separate collection, with its own finding aid.

I am grateful to the John Crerar Foundation who provided support for this project (and who also provided support for processing the W.W. Morgan Papers and Yerkes Logbooks which will be processed shortly). I am also grateful to the staff of the Special Collections Research Center for all of their hard work. **Barbara**

William SHEEHAN (Willmar, MN)

●.....Subject: Mars observation report 2nd July

Received: Mon 25 July 2011 4:04 PM

Dear Sirs, Here is my first contribution about Mars present opposition performed with the 150mm refractor. I attach also here a first view of Uranus with the same means.

I would like to raise a question to the Mars section: "During the Meudon meeting it was set a proposition consisting in affirming that the blue clearing effect remains more coming from the reflectivity properties of the ground more than the scattering properties of the high layers of the planet atmosphere".

This is an interesting study but when considering morning with 360x and the RC200. For your perusal. Good skies. Faithfully

○.....Subject: Uranus and Mars observations from SMk last 10th Aug.

Received: Thursday, August 11, 2011 2:41 PM

Hi good morning Masami san, here are some observations of Uranus and Mars performed last 10th.

Mars: Solis Lacus area accessible. At the terminator edge bright area (revealed and shown as C, clear) in yellow color. The north pole area whitish (hood?). Argyre very clear collected. Chryse clear also (brightness area were quoted in comparison). Almost fixed images on Mars (height 28° only) and on Uranus (height 41°) on this morning with 360x and the RC200. For your perusal. Good skies.

Faithfully

Stanislas MAKSYMOWICZ

(Ecquevilly, FRANCE)

●.....Subject: Mars - July 30th, 09:36ut, 2011

Received: Tue 2 Aug 2011 06:31:10 JST

Hello (Saludos) To the CMO/ISMO team, My first attempt on the red planet (Mars) it's not the best but some albedo features could be seen. Clear Skies to All.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/110730/EMr30July11.jpg>

○.....Subject: Mars - August 10th, 09:45ut

Received: Fri 12 Aug 2011 01:55:20 JST

Hi Mr. Minami, Here is my recent session of mars from august 10th under the most favourable conditions. . . . Clear Skies

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/110807/EMr07Aug11.jpg>

Efrain MORALES (Puerto Rico)

●.....**Subject:** *Dusty Mars on Aug 04 for your database*
Received: Sat 8 Aug 2011 13:24:09 JST

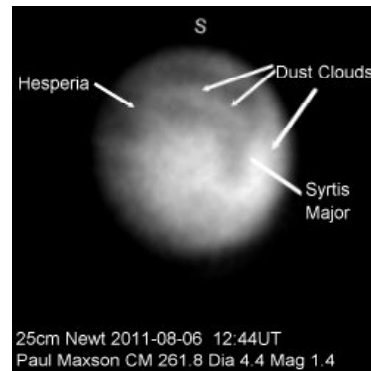
Please see attachment. Over the Winter I bought an 18-inch Newtonian, NGT-18 made by JMI in 1982. So I have a new-old scope. It seems to have excellent optics. The mirror was made by Galaxy Optics. Questions or comments?

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/110804/JMI04Aug11.jpg>

Best regards,

○.....**Subject:** *Mars Image 20110806*
Received: Sat 13 Aug 2011 11:58:18 JST

Paul Maxon has permitted me to send one of his



images that I annotated to indicate the spread of dust clouds Eastward from Hellas that I imaged on 20110804.

Best regards,

Jim MELKA (ALPO)

(*Editorial Note*): THEMIS dust opacity image during 2 August to 8 August does not show any serious dust.

☆☆☆

Ephemeris for the Observations of the 2011/12 Mars. II

September 2011

Masami MURAKAMI

As a sequel to the preceding list of the Ephemeris for the physical observations of Mars, we here list up the necessary elements of the Ephemeris for period from 25 August 2011 to 4 October 2011: The data are listed for every day at 00:00 GMT (not TDT). The symbols ω and ϕ denote the Longitude and Latitude of the sub-Earth point respectively. The symbols λ , δ and ι stand for the Areocentric Longitude of the

Sun, the Apparent Diameter and the Phase Angle respectively. We also add the column of the Position Angle Π of the axis rotation, measured eastwards from the north point: This is useful when we determine the north pole direction from the $p \leftarrow f$. The Apparent Declination of the planet is also given at the final column (denoted D). The data here are basically based on *The Astronomical Almanac for the Year 2011*.

Date (00:00GMT)	ω	ϕ	λ	δ	ι	Π	D
25 August 2011	251.66°W	8.9°N	350.05°Ls	4.62"	29.0°	-19.0°	+23°17'
26 August 2011	241.95°W	9.2°N	350.57°Ls	4.63"	29.1°	-18.6°	+23°13'
27 August 2011	232.27°W	9.4°N	351.08°Ls	4.64"	29.2°	-18.3°	+23°10'
28 August 2011	222.56°W	9.7°N	351.59°Ls	4.65"	29.3°	-17.9°	+23°06'
29 August 2011	212.88°W	9.9°N	352.11°Ls	4.67"	29.5°	-17.5°	+23°02'
30 August 2011	203.17°W	10.2°N	352.62°Ls	4.68"	29.6°	-17.1°	+22°58'
31 August 2011	193.49°W	10.5°N	353.13°Ls	4.69"	29.7°	-16.8°	+22°54'
01 September 2011	183.80°W	10.7°N	353.64°Ls	4.70"	29.9°	-16.4°	+22°49'
02 September 2011	174.09°W	11.0°N	354.15°Ls	4.72"	30.0°	-16.0°	+22°45'
03 September 2011	164.41°W	11.2°N	354.66°Ls	4.73"	30.2°	-15.6°	+22°40'
04 September 2011	154.72°W	11.5°N	355.17°Ls	4.74"	30.3°	-15.3°	+22°35'
05 September 2011	145.02°W	11.7°N	355.68°Ls	4.75"	30.4°	-14.9°	+22°30'

Date (00:00GMT)	ω	φ	λ	δ	ι	Π	D	
06 September 2011	135.32°W	12.0°N	356.18°Ls	4.77"	30.6°	-14.5°	+22°25'	
07 September 2011	125.64°W	12.2°N	356.69°Ls	4.78"	30.7°	-14.1°	+22°20'	
08 September 2011	115.95°W	12.4°N	357.19°Ls	4.79"	30.8°	-13.8°	+22°14'	
09 September 2011	106.26°W	12.7°N	357.69°Ls	4.81"	30.9°	-13.4°	+22°09'	
10 September 2011	096.56°W	12.9°N	358.20°Ls	4.82"	31.0°	-13.0°	+22°03'	
11 September 2011	086.88°W	13.1°N	358.70°Ls	4.84"	31.1°	-12.6°	+21°57'	
12 September 2011	077.18°W	13.4°N	359.20°Ls	4.85"	31.2°	-12.2°	+21°51'	
13 September 2011	067.49°W	13.6°N	359.70°Ls	4.87"	31.3°	-11.8°	+21°45'	
14 September 2011	057.80°W	13.8°N	000.20°Ls	4.88"	31.5°	-11.5°	+21°38'	
15 September 2011	048.11°W	14.1°N	000.69°Ls	4.90"	31.6°	-11.1°	+21°32'	
16 September 2011	038.42°W	14.3°N	001.19°Ls	4.91"	31.7°	-10.7°	+21°25'	
17 September 2011	028.73°W	14.5°N	001.69°Ls	4.93"	31.8°	-10.3°	+21°19'	
18 September 2011	018.03°W	14.7°N	002.19°Ls	4.94"	32.0°	-9.9°	+21°12'	
19 September 2011	009.36°W	15.0°N	002.68°Ls	4.96"	32.1°	-9.5°	+21°05'	
20 September 2011	359.67°W	15.2°N	003.18°Ls	4.97"	32.2°	-9.2°	+20°58'	
21 September 2011	349.98°W	15.4°N	003.67°Ls	4.99"	32.3°	-8.8°	+20°51'	
22 September 2011	340.29°W	15.6°N	004.17°Ls	5.01"	32.5°	-8.4°	+20°44'	
23 September 2011	330.60°W	15.8°N	004.66°Ls	5.02"	32.6°	-8.0°	+20°36'	
24 September 2011	320.91°W	16.0°N	005.15°Ls	5.04"	32.7°	-7.6°	+20°29'	
25 September 2011	311.22°W	16.2°N	005.64°Ls	5.06"	32.8°	-7.2°	+20°21'	
26 September 2011	301.53°W	16.4°N	006.13°Ls	5.08"	32.9°	-6.9°	+20°13'	
27 September 2011	291.85°W	16.6°N	006.62°Ls	5.09"	33.0°	-6.5°	+20°06'	
28 September 2011	282.16°W	16.8°N	007.11°Ls	5.11"	33.1°	-6.1°	+19°58'	
29 September 2011	272.47°W	17.0°N	007.60°Ls	5.13"	33.2°	-5.7°	+19°50'	
30 September 2011	262.79°W	17.2°N	008.09°Ls	5.15"	33.3°	-5.3°	+19°41'	
01 October 2011	253.10°W	17.4°N	008.57°Ls	5.16"	33.4°	-5.0°	+19°33'	
02 October 2011	243.42°W	17.6°N	009.06°Ls	5.18"	33.5°	-4.6°	+19°25'	
03 October 2011	233.74°W	17.8°N	009.54°Ls	5.20"	33.6°	-4.2°	+19°17'	
04 October 2011	224.04°W	17.9°N	010.03°Ls	5.22"	33.8°	-3.8°	+19°08'	- - -

TEN YEARS AGO (195)

-----CMO #249 (10 August 2001) pp3091-3106 -----

<http://www.hida.kyoto-u.ac.jp/~cmo/cmo/249/cmo249.html>

Here is treated the period of the latter half of July 2001 (#13) during which the season proceeded from $\lambda=196^\circ\text{Ls}$ to 205°Ls , and the δ went down from $19.1''$ to $17.2''$. The φ was around 7°N . The phase angle ι increased to 35° . On 31 July the 38 days passed since the start of the dust. In 1956 the dust became rather transparent within 20 days, but this time it was still dusty. A total of 299 reports came domestically, and 50 from abroad. TAN (WTn) in Singapore sent us 17 sets of images.

The dust was apparently global, whereas in Europe some part of M Cimmerium was misunderstood as M Sirenum or clear M Cimmerium. The two streaks of dust near Solis L came into sight from Japan, and observed at Okinawa on the occasion of the

CMO Meeting on 20 and 21 July. This was observed in the US at the end of July and treated as another new dust.

Here the movement of the npf was treated in detail. It was active from the beginning of July to the north of Ascræus Mons, while on 16 July [23 days] it was conspicuous following M Acidalium. On 17 July an especially bright point was observed as a protrusion. MINAMI (Mn) visually observed and HIGA (Hg) saw it on a monitor; rather bluish. On the day Wtn took images, but the processing of the B images was too weak to check the white spot. On the occasion of the Meeting at Okinawa on 20 July [27 days] the npf consisted apparently of two bright patches as traced by TSUNEMACHI (Ts) and HIKI (Hk). On 21 July, the npf looked less active though the area between Deuteronilus and the dark band of the npf was bright (Mn, Mk). On 22 July [29 days] the dust stream to the east of M Acidalium was complex, and it looked as if M Acidalium was doubled (Ts, Mn). MORITA (Mo) took it at home. But on 23 July the normal scene was recovered. The npf was active also at the end of July, and in the US a protrusion of the npf was observed to the north of Ascræus Mons. The report of the activity of the npf at this time was summarised as "The North Polar Hood during the Dust Clouded Period. I -II" in

<http://www.hida.kyoto-u.ac.jp/~cmo/cmomn1/260Note6.htm>

<http://www.hida.kyoto-u.ac.jp/~cmo/cmomn3/262Note8/index.htm>

The npf itself was not thick and the northern part of M Acidalium was sometimes seen through and the markings around the npf tended to appear dark. The dust looked to avert the dust. Still Tharsis Montes were observed dark, while Ascræus Mons looked to be weaker than others.

S. Sabaeus-like dark band on Noachis existed still and darker than S Sabaeus, and Hellesponticae Depressiones was bluish dark. The following side of the spc was constantly covered by a thick morning white mist or frost which was sometimes misunderstood as the spc.

LtE was received from N FALSARELLA (Brasil), D MOORE (AZ), M VALIMBERTI (Australia), Ed GRAFTON (TX), B COLVILLE (Canada), Wtn (Singapore), M Di SCIULLO (FL), J ROGERS (UK), N BIVER (the Netherlands), Don PARKER (FL), Alan HEATH (UK), T CAVE† (CA), and domestically from Mo, ASADA, KUMAMORI, WAKUGAWA and AKUTSU.

FORTHCOMING 2001 MARS (12) was "Ephemeris for the 2001Mars. V" written by A NISHITA.

(Mk & Mn)

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COMMUNICATIONS IN 東亞天文學會『火星通信』since 1986

MARS

No. **249**
10 August 2001

OBSERVATIONS Published by the OAA Mars Section
CMO 2001 Mars Report # 13 OAA Mars Section

2001年七月後半(16 July~31 July)の火星面観測
CMO Mars Observations in the Second Half of July 2001
(from 16 July 2001 (196°Ls) to 31 July 2001 (205°Ls))
南 政 次 Masatsugu MINAMI

THE global yellow cloud stays longer than expected, while the great dust storm in 1956 was made thinner within twenty days or one month. So the usual season may not work at present, but the season reached 200°Ls on 22/23 July. During the period from 16 July (196°Ls) to 31 July (205°Ls), the angular diameter δ went down = from 19.1" to 17.2". The central latitude ϕ went up from 7.3°N to 7.4°N, = but went back to 7.0°N at the end of July. The phase angle ι increased from 26° to 35°. The apparent declination was still going down.

が……1956年の大塵雲は二十日ぐらいで消えて来たが、今回はやや長く覆っている。多分季節は崩れているであろうが、16Julyは196°Ls、31Julyでは205°Lsであった。その間、視直径は19.1"から17.2"に落ちた。中央緯度は7.3°Nから7.4°Nまで延びたが、月末には7.0°Nへ落ちてきた。以後南の方へ進む。位相角は26°から35°へ増した。火星の高度は未だ下がっている。

THIS time we received still a lot of observations from the following observers:
が……今回の報告観測者・観測数は次の通りである。

AKUTSU, Tomio 阿久津 富夫 (Ak) 栃木・島山 Tochigi, Japan
6 Sets of CCD Images (16, 20, 27, 30 July 2001) /70x32cm spec with a Teleris 2

ASADA, Tadashi 浅田 正 (As) 福岡・宗像 Munakata, Fukuoka, Japan
5 Sets of CCD Images (21, 23, 27 July 2001) 30cm spec equipped with a Lynxx PC

BIVER, Nicolas ニコラ・ビヴェール (NBv) Versailles, France / Noordwijk, Nederland
10 Colour Drawings (12, 14, 16, 20, 21, 24, 28, 30 July 2001)
330x26cm speculum/200x20cm speculum

CAVE, Thomas R トマス・ケーズ (TCv) 長堤 Long Beach, CA, USA
4 Drawings (14, 18, 19, 27 July 2001) 400x35cm speculum

Di SCIULLO, Maurizio モーリチオ・ディ・シウロ (MS) 佛羅里達 Coconut Creek, FL, USA
1 Set of CCD Images (31 July 2001) 25cm Excelsior Optics E-258

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TEN YEARS AGO (196)

-----CMO #250 (25 August 2001) pp3107~3122-----

<http://www.hida.kyoto-u.ac.jp/~cmo/cmo/250/cmo250.html>

This is the 14th report in 2001 treating the period of the first half of August: The season was from $\lambda=206^\circ\text{Ls}$ to 214°Ls , but because of the presence of dust none felt the sense of the season. The δ was from 17.0" to 15.2" and the phase angle ι increased from 35° to 40°. The ϕ was from 7°N to 5°N. The apparent declination was still southward. Domestically we received 186 observations, and from abroad 60 observations. TSUNEMACHI (Ts) and MINAMI (Mn) returned home on 5 Aug and 12 Aug respectively from Okinawa: During about one month there were no impossible days to observe. In the Kwanto district where Mk stayed after Naha the weather was dismal and no more than few observations were possible.

In this period still the dust was vast, but some markings were seen through. From around 9 Aug [47 Days] M Cimmerium was rather recovered while the southern Electris was dusty bright. Olympus Mons and others were still dark spots; just Ascræus Mons was weaker. PARKER (DPk) caught the lower dust near around the area of Auroræ S. S Meridiani and Margaritifer S were thinly visible. The nph became weaker since the altitude of the Sun was lower after the autumnal equinox: The inside was not uniform and looked rather inactive. The dark blue perimeter of the nph became thus a bit indistinct from around 4 Aug [42 Days]. The spc was not vivid; the bright morning limb frost or mist which was seen around from 7 July [14 days], but from 4 Aug [42 days] it was weaker and invisible from 12 Aug [50 days]. The activity of the nph also decreased from [45 days] to [50 days].

LtE were received from D PARKER (FL), Wei-Leong TAN (Singapore), N BIVER (the Netherlands), F MELILLO (NY), M VALIMBERTI (Australia), D MOORE (AZ), R SCHMUDE (GA) and AKUTSU, HIKI, KUMAMORI, ISHBASHI, MORITA, and ISHADOH. A letter from Fujisawa was also written by Mk.

As FORTHCOMING 2001 MARS (13) A NISHITA wrote "Mars' Apparent Declination" until April 2002 to find Mars in the twilight. Ts's Essay is concerned with her hitherto experience of the observations of the Solar spots. In Okinawa she enjoyed the watching of the Sun spots by the use of a small refractor of HIGA under the glittering Sun.

Director's Report #07 was columned:

http://www.hida.kyoto-u.ac.jp/~cmo/cmo/ds2001/ds/d_repo.html

TYA #072 treated by Mk about CMO#108 (25 August 1991): Mars of 20 years ago was near the Sun (conjunction was in November), and 1990 OAA Mars Note started: the first one was about the morning cloud to the NW of Hellas during 340°Ls~360°Ls. In addition, as 1988 CMO Note (15), Mn described about the morning mist at Thaumasia which was observed at the beginning of October 1988. Mn's interesting Japanese essay on Topsy-Turvy in the East and the West was put in.

(Mk & Mn)

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COMMUNICATIONS IN
MARS

No. **250**
25 August 2001

OBSERVATIONS Published by the OAA Mars Section

CMO 2001 Mars Report # 14 OAA Mars Section

2001年八月前半(1 Aug~15 Aug)の火星面観測

CMO Mars Observations in the First Half of August 2001

from 1 August 2001 (206°Ls) to 15 August 2001 (214°Ls)

南 政 次 Masatsugu MINAMI

THE apparent diameter of the planet decreased from 17.0 arcseconds to 15.2 arcseconds during the period. The central latitude ϕ varied from 7°N to 5°N. The season proceeded from 206°Ls to 214°Ls. The season does not seem to mean anything because of the dust. The evening, while the altitude of the Sun on the southern hemisphere is steadily rising (Ds was from 11°S to 14°S). The phase angle ϵ was deep from 35° to 40°. The south circumpolar region is governed by the mid-night Sun, while the opposite circumpolar region including the north polar cap has no Sunbeam whole day.

この間、火星の視直径は17.0秒角から15.2秒角に落ちた。季節は206°Lsから214°Lsに進んだ。現在、現在に覆われて季節感がない。ただ、着実に南半球では太陽の高度が上がっている(Dsで言えば11°Sから14°Sへ)。中央緯度は7°Nから5°Nへ落ちた。位相角 ϵ は35°から40°へと深くなっていく。南極圏は白夜なのに、北極圏は闇に覆われている。

WE are thankful to the following observers who contributed to the CMO this time:

AKUTSU, Tomio 阿久津 富夫 (AK) 栃木・岡山 Tochigi, Japan

2 Sets of CCD Images (3 August 2001) /70x32cm speculum with a Teleris 2

BARNETT, John H. ジョン・バーネット (JBn) 維吉ニア VA, USA

2 Drawings (22 July; 3 August 2001) 270, 360x18cm refractor,

BIVER, Nicolas ニコラ・ビヴェール (NBv) Versailles, France/ Noordwijk, Nederland

6 Colour Drawings (1, 5, 9, 11, 12, 14 August 2001) 300x20cm spec/330x26cm spec

CAVE, Thomas R. トマス・ケーヴ (TCv) 長堤 Long Beach, CA, USA

1 Drawing (5 August 2001) 400x33cm speculum

HEATH, Alan W. アラン・ヒース (AHh) ノッティンガム Nottingham, UK

1 Note (1 August 2001) 160, 80x20cm SCT

HIKI, Toshiaki 日越 敏明 (HBk) 長野・箕輪 Minowa, Nagano, Japan

5 Drawings (3, 9, 13 August 2001) 430x22cm speculum

3 1 0 7

International Society of the Mars Observers (ISMO)

Advisory Board: Donald PARKER, Christophe PELLIER, William SHEEHAN, and Tadashi ASADA, Masatsugu MINAMI

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CMO #388/ ISMO #14 (25 August 2011)

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