ISSN 0917-7388

COMMUNICATIONS IN

CMO Since 1986

MARS

No.375

25 August 2010

OBSERVATIONS

No.01

Published by the International Society of the Mars Observers

Observing Red Surfaces on Mars in Violet Light

(from 2005 apparition)

By

Christophe PELLIER

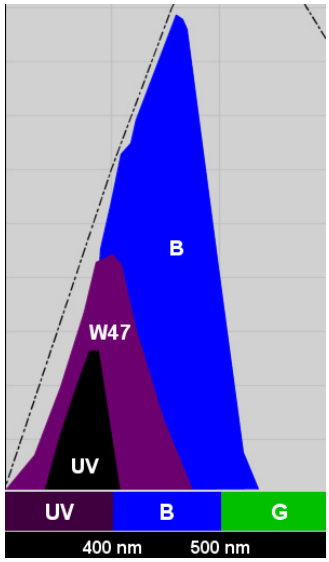
The reason that amateur observers use blue filters to observe Mars is that, owing to contrast effects, the visibility of white clouds is much enhanced. In short wavelengths, the ochre surface of the planet absorbs light and appears darker, while water clouds continue to reflect these wavelengths. Some observers have also experimented with violet or UV filters, which prove to be even more effective in bringing out these contrasts, as they produce a further darkening of the martian soils and lead to enhanced white clouds. When this was done during the 2005 apparition, much unexpected detail was revealed. The first ISMO paper reviews the appearance of anomalous dark markings seen on images taken with filters such as the Wratten 47 and makes some attempts to explain the situation.

Filter techniques

The transmission curves of different blue filters are presented on Fig. 1 (dashed line is QE of the SKYnyx 2-0M chip). Note the following:

1. The B filter is the one used for RGB trichomy, and transmits between 400 and 500 nm (the « B » band). A leak in the near-UV (before 400 nm) has no effect on the images.

2. The UV filter (Schuler - shown for information) passes light from before 350 nm to around 400 nm (the « U » band). This has often been used to reveal special details such as the so-call ultraviolet markings in the clouds of Venus.

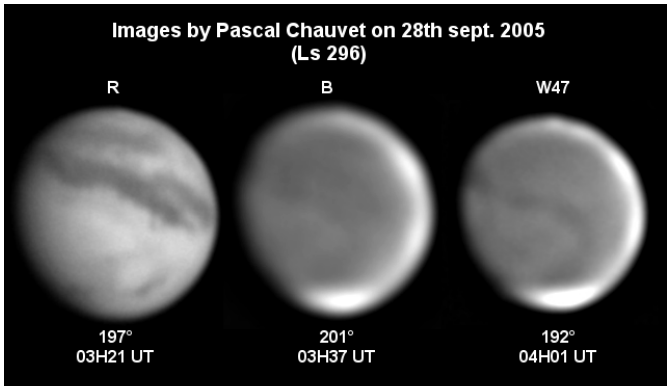


3. The W47 transmission is based on an old gelatin filter from Kodak. Curiously, the official transmission curve does not agree with the observed specifications, as instead of the putative peak near 440 nm in blue light, the actual peak lies in the near-UV around 390 nm! [1] The W47 has become popular with amateurs in recent years for imaging Venus, Jupiter and Saturn. It is better at revealing details in UV than in blue (thus the venusian details are nicely contrasted, while they remain faint in B). Adapting the real transmission curve to that of a CCD chip such as the ICX424 (SKYnyx 2-0M cam-

era) shows that its effective peak lies exactly at 400 nm, just at the boundary between B and UV [2]. Results on Mars also demonstrate the difference between the W47 and any B filter.

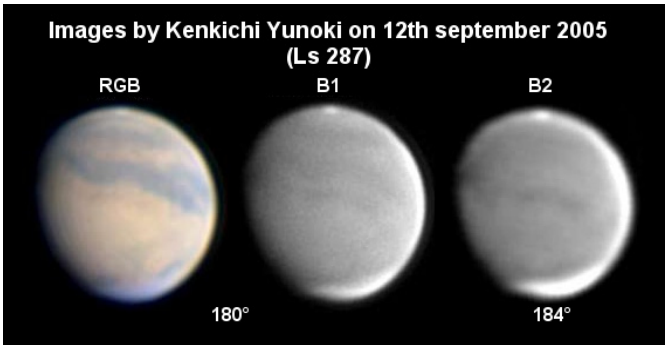
The dark Valhalla « serpentine »!

The SAF Mars section received an amazing W47 image taken by the French observer Pascal Chauvet on 28 September 2005 (λ=296°Ls, ι=30°), which revealed an isolated dark serpentine feature cutting



across the entire martian disk. It was located in the same longitudes as southern Maria Cimmerium and Sirenum, and had a similar shape, and at first sight could be mistaken for these markings. However, it lay in the middle of the disk, while Cimmerium is farther south (at longitude 192°, its latitude is around 30°S; note that the declination of Earth at the time was 11°S). In Fig. 2 we have Chauvet's R image taken 40 minutes earlier; it clearly shows that this contrasted feature corresponds to an elusive marking that has appeared ever since 1988 (observed by Bill SHEEHAN et al), and has been nicknamed « Valhalla » by them. As demonstrated by Chauvet's images, Valhalla is none other than the dark line just north of Tyrrhenum, Cimmerium and Sirenum that seems to follow the contours of those classical features.

The dark-violet Valhalla was observed in the same month by the Japanese observer Kenkichi Yunoki (Fig. 3). Yunoki used two blue filters (designed « B1 » and « B2 » on his sets). The « B2 » filter peaked at 390 nm in UV and showed no transmission out at 450 nm and beyond, meaning that it was even bluer than the W47.[3] Both B1 and B2 filters repeatedly showed significant albedo and even variations in Valhalla.



A matter of color ?

The surprising darkness of Valhalla on the violet images is not the only interesting aspect; equally impressive is the complete absence of any trace of the southern maria. While belonging to the more prominent surface markings in visible light, Tyrrhenum, Cimmerium and Sirenum disappear in short wavelengths. One might be tempted to imagine them obscured by clouds were it not that the usual B images taken by Chauvet and Yunoki still show the maria clearly, and it is evident that the Martian sky was transparent and cloudless (Figs. 2 and 3). This, however, is exactly as expected; after all, the season was high summer in the southern hemisphere, the driest, most water-vapor poor, season on Mars.

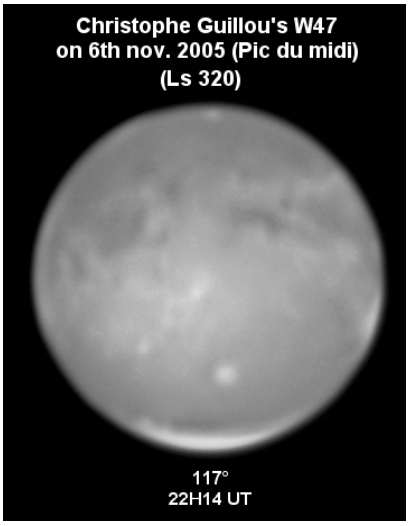
True-color RGB processing helps us to understand whence arises the striking difference between Valhalla and the southern maria. Obviously, they must represent very different terrains with characteristic tints. Figure 4 shows an image by Christian Fattinnanzi which is processed to enhance these differences. Where Mare Cimmerium is, for example, a classical greyish albedo marking, Valhalla is truly red. The color looks also different from those usually found in the desert regions, which are not « red » but more orangish (to

adopt a simple classification; however, we hasten to add that the Martian colors are actually quite complicated, as will be discussed in future issues of ISMO). Valhalla's red color, and the terrain's physical properties, whatever they may be, are bound to produce strong absorption in violet light; indeed it is stronger than that of any other terrain on Mars.

A matter of relief ?

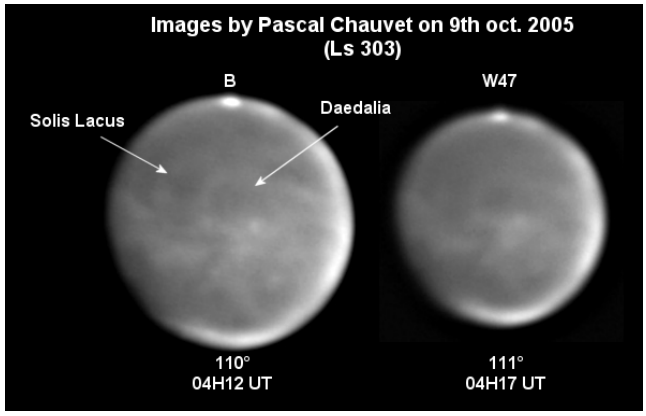
The variable aspect of Valhalla has piqued interest among amateurs, who have always been interested in anything suggesting change or development. They soon noticed that this curious feature was more visible at quadrature and less so near opposition[4]. Spacecraft imagery reveals that Valhalla corresponds to a sloped terrain occupying the boundary of the so-called "Great Dichotomy" between the ancient, rugged terrains in the southern hemisphere and the more recent, low-lying plains in the northern. That being the case, it appears that its greater darkness far from opposition, especially when it lies near the terminator (either martian evening or morning), is simply explained by the depth of shadow when the Sun is either rising or setting on the feature. A similar phenomenon is observed, and for similar reasons, with respect to the summits of the great Tharsis volcanoes. In both cases the amateur is able to observe shadows due to actual relief, similar to what Galileo with his small telescope observed with the mountains and craters he observed along the terminator of the Moon.

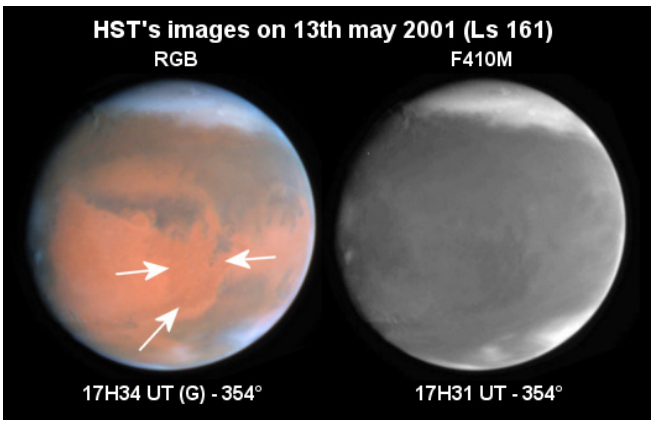
We deduce the effects of relief from the darkness of Valhalla in violet partly because we see the effect vanish at opposition. When the angle of light reflection from the surface is small, the usual dark markings become visible not only in RGB but even in UV light (which is the basis, by the way, of the famous "Blue Clearing," that long tantalized amateur and professional observers of the planet and about which so much nonsense was written). The "opposition effect" relative to Valhalla, on the other hand, is to render it very faint[5]. At opposition we see no shadow phenomenon on Mars just as we do not see any at full Moon. Yet another valuable W47 image illustrating these points is presented as Fig. 5; obtained on opposition night with the 1-meter Cassegrain at Pic du Midi by amateur Christophe Guillou, it shows the « normal » surface completely uncovered[6].



Other examples of reddish surfaces having anomalous aspect in violet

Valhalla is the most striking of features which have an anomalous appearance in violet, but several others behave similarly under the same conditions (i.e., they appear strongly darkened with the W47). All are reddish markings, though some are reddish grey. Among these, Daedalia is the most important; it is markedly darkened in violet light, even as the adjacent Solis Lacus appears greatly faded (see Fig. 6 – and refer also to Fig. 5 where only a faint trace of Daedalia can be made out at opposition). The north-west boundary of the Arabia plateau also has this reddish hue. Figure 7 shows this aspect of Arabia with images taken by the Hubble space telescope on 13th may 2001 (© Jim Bell – RGB processing by the author[7]). The HST's B filter (F410M) peaks at 410 nm in deep blue, but with a rapid cut





off near 420 nm so the filter looks very close to the W47. The western as well as the northern part of the plateau is very dark in the F410M; but note that the Sinus Meridiani is no longer visible. Lunae Planum is also expected to exhibit this behavior, however, it has not yet been observed (except, perhaps, in images from HST obtained during its observing run on 30 Dec. 1997). This is an area for further investigation.

Other reddish features

These reddish features appear to be permanently red, with the exception of Daedalia in which frequent and profound changes of shape and albedo occur. But there are also a number of other reddish or reddish-brown details on Mars that should not be classified with the features described above. Tempe, for instance, appeared strongly reddish in January 2010. At the time the atmosphere above it was very clear, and the reddish coloring was a simple case of contrast with the cloudy areas around it.

Conclusions

A number of peculiar reddish markings on Mars, which appeared dark in violet and the UV, were observed for the first time in 2005. They do not seem to have been noticed before, probably only because violet and UV filters have rarely been used on Mars during prior apparitions. The reason for this neglect is that, generally, Mars appears extremely dark in those wavelengths; only in 2005 was enough imaging carried out with the W47 to reveal these features. During the aphelic apparitions of 2007 and 2010, intense cloud activity masked the surface and effectively prevented their further study.

Mars has always been regarded as one of the most colorful planets, from the early days when it reminded naked-eye observers of a drop of blood in the sky, to the days when Percival Lowell and others described its hues as those of a fire-opal, or of robin's egg blue mottlings cast against a background of salmon-pink. The peculiar reddish markings add another chapter to that story.

Finally the author would like to thank Bill Sheehan for having corrected his original text.

(**footnotes**)

1. This has been first established by the french solar observer Philippe Rousselle in 2006 with the W47 owned by the author. Phil's page is at http://www.astrosurf.com/spectrohelio/filtres.php

2. See my page http://pellier.christophe.perso.sfr.fr/W47e.htm Beware that the W47 has also a huge IR leak that must be eliminated by any IR-blocking glass.

3. As presented on a set of his on 8th November 2005.

4. This has been noticed at many times by Don Parker on his sets of images.

5. It is even hard to outline on the HST image taken on 8th november 2005. See http://hubblesite.org/gallery/album/solar_system/mars/pr2005034p/

6. The changing aspect of dark markings in blue light as long been analyzed through the so-called « blue layer » paradigm ; however we know today that this is a pure surface effect due to geometry of sunlight. Read Masatsugu Minami's note in CMO#128 « Blue layer ? » http://www.hida.kyoto-u.ac.jp/~cmo/cmomn2/Cahier02.htm

7. HST images from 2001 spring can be seen on Jim Bell's homepage http://marswatch.tn.cornell.edu/hst01.html

CMO 2009/2010 Mars Report #19

CMO/OAA-->ISMO

NO longer are observable the details of the planet Mars because it is now far away, while Yukio MORITA (*Mo*) tried to shoot the disc so often and hence we here review them: The period of this

occasion was from

16 July 2010 (λ=119°Ls) to 15 August 2010 (λ=133°Ls)

during which the apparent diameter δ went down from 4.9" to 4.5". Furthermore its apparent declination D became quite low from 4°N down to 3.6°S, and so it is only observable around the sunset. The central latitude ϕ was 26°N, and the phase angle ι went up from 33° to 28°.

In Japan ever since the rainy season ended on 17 July, the terrible hot summer visited, and even at Mikuni (near Fukui) the temperature went up to 38.6°C on 5 August.

#--------We received the observations this time as follows.

MAKSYMOWICZ, Stanislas (*SMk*) Ecquevilly, France

2 Sets of Drawings (17, 25 July 2010) 300×20cm Cassegrain

MINAMI, Masatsugu (*Mn*) Fukui*, Fukui, Japan

4 Drawings (18, 26 July 2010) 400×20cm *F/12* Goto ED refractor*

MORITA, Yukio (*Mo*) Hatsuka-ichi, Hiroshima, Japan

11 Sets of *RGB* +11 *LRGB Colour* + 11 *L* Images (17, ~ 19, 21, ~23 July; 1, 6, 15 August 2010)
25cm speculum @*f*/85~90, 60 with a Lu-075M

NAKAJIMA, Takashi (*Nj*) Fukui*, Fukui, Japan

4 Drawings (18, 26 July 2010) 400×20cm *F/12* Goto ED refractor*

(*The Observatory, Fukui City Museum of Natural History)

#--------This time MORITA (*Mo*)'s work centres on, and so we describe as the days went by. On 17 July (λ=120°Ls) at ω=063°W, *Mo* showed that M Acidalium was dark as well as the area of Aurorae S, and the npc was definite. Especially the morning mist looked strong. On 18 July (λ=120°Ls) at ω=050°W, 054°W the seeing was poorer, while the aspect was the same as the day before. At Fukui NAKAJIMA (*Nj*) and MINAMI (*Mn*) observed from before sunset at ω=038°W~053°W on the day: The result was similar to *Mo*'s observations: M Acidalium was well dark and the npc was bright clear. The evening limb was also bright. *Mo*'s work on 19 July (λ=120°Ls) at ω=043°W was similar, but just Noachis showed a bit up at the limb side. On 21 July (λ=121°Ls) at ω=023°W *Mo* shot out S Meridiani. The npc is clear and the morning mist covers Niliacus L to make it bluish. On 22 July (λ=122°Ls) at ω=013°W, S Sabaeus became apparent and the npc is roundish in R. In B the morning mist is thick. On 23 July (λ=122°Ls) at ω=008°W, M Acidalium was seen considerably to the morning side. The area around the npc is roundish large. On 26 July (λ=124°Ls) *Nj* and *Mn* at Fukui observed from ω=325°W to 340°W: The evening Syrtis Mj was dark, and the Libya mist at the limb was thick. The npc was visible. Hellas was dull perhaps because of the tilt. *Mo*'s observations on 1 Aug(λ=127°Ls) at ω=270°W, 275°W proved that Syrtis Mj on the morning side was really bluish. The upper Hellas was a bit bright. In R, Utopia is dark definite, but in RGB and LRGB it was rather faint. The images on 6 Aug (λ=129°Ls) at ω=226°W showed the region where the markings were rare, and the npc was obscure. On 15 Aug (λ=133°Ls) at ω=131°W, the south-eastern limb suggests a dark marking sinking. The npc was visible in RGB.

On the other hand, in Europe MAKSYMOWICZ (*SMk*) observed on 17 July (λ=120°Ls) at ω=191°W ~197°W, and on 25 July (λ=123°Ls) at ω=115°W: The former sketches do not tell much; just the area around the npc being large. The later drawing definitely showed the area of Solis L and described the sinking M Acidalium near the evening limb (used Wr#11).

#--------In the next issue we shall review the observations made in the latter half of August 2010.

Masatsugu MINAMI (*Mn*) & Masami MURAKAMI (*Mk*)

CMO 09/10 Mars Note (3)

Bluish Markings in the Morning after the Northern Spring Equinox

0° Introduction

Some time after the northern spring equinox, a rather thick morning mist appears to the north of the equatorial band and this gives rise to a light bluish tint on the morning markings which stay near the equatorial band just after the early morning. This has been observed hitherto by the naked eyes if no colourful filter is used, while recently it has become easier to trap it by the ccd colour images, if its B ingredient is excellent. The Martian surface does not emit the violet light, and hence the B image is usually dark except for the polar caps as well as the white cloud/mist. Especially the cloud/mist permits us to grasp an interesting change of colour of the Martian marking at around the area where the cloud/mist prevails. Here we pay attention especially to the morning case in the 2010 apparition. As will be stated below the RGB image much depends on the treatment of the B image.

Here we treat the areas about 1° the morning Syrtis Mj, 2° the Ætheria dark patch, and 3° the area of M Acidalium. We sometimes disregard the images if some good B images are not accompanied.

1° Morning Syrtis Mj

First of all Tomio AKUTSU (*Ak*)'s images on 2 Feb (λ=046°Ls) at ω=220°W, 226°W show that Syrtis Mj near the terminator is quite bluish, especially the former. In B the white mist is not so strong but the B image is excellent.

On 17 Feb (λ=053°Ls), Martin LEWIS (*MLw*) at ω=220°W and Simon KIDD (*SKd*) at ω=223°W also suggest the phenomenon but no B image is attached and in the *MLw* case the two colour images presented show quite different colour nuance.

On 22 Feb (λ=055°Ls), Randy TATUM (*RTm*) shows the phenomenon a bit at ω=237°W without B. At the same angle Pete GORCZYNSKI (*PGc*) put forward a set of RGB with good B where a blue morning Syrtis Mj is shown though the LRGB does not look so clear.

By chance on 23 Feb (λ=055°Ls) Efrain MORALES (*EMr*) took a set at the same angle ω=237°W where Syrtis Mj looked more dark bluish. The B image is good in the sense that the area to the west of the Ætheria dark patch is darkish.

Bill FLANAGAN (*WFl*) took on 25 Feb (λ=056°Ls) at ω=221°W where the colour Syrtis Mj is not yet clear perhaps because it is somewhat early or because of the weaker morning mist or due to the L filter.

Damian PEACH (*DPc*)'s images on 21 Mar (λ=067°Ls) at ω=252°W: The morning Syrtis Mj is blue, and even so at ω=261°W. The latter B image shows a shadowy image of Syrtis Mj a bit, but this is not the so-called the "blue clearing" but this implies that the morning mist is relatively thicker around at Libya and Æria.

On 24 Mar (λ=068°Ls) at ω=225°W Ralf GERSTHEIMER (*RGh*) provides a good, dark B, but the Libya mist is weak, and Syrtis Mj looks very faint, maybe it's because slightly earlier in time.

On 28 Mar (λ=070°Ls), *PGc* took at ω=259°W, while Don PARKER (*DPk*) at ω=258°W: *PGc* shows a faint Libya mist and so Syrtis Mj is normally bluish, whereas in contrast *DPk* heavily processed the B image where Æria is white but Syrtis Mj is slightly darker, and hence Syrtis Mj is dark bluish. *DPk* uses a false term Blue Syrtis Cloud: This is just because of the presence of the morning white mist around there. Same the images at ω=264°W.

WFl's images on 30 Mar (λ=071°Ls) at ω=260°W also show a dark bluish Syrtis Mj because of the similar reason. The description of the Libya mist is good so that the images are mild.

On 31 Mar (λ=071°Ls) at ω=255°W, *EMr* also puts forward a similar Syrtis Mj. At these angles the morning mist is not so thick as to conceal completely the area of Syrtis Mj in B.

On 26 Apr (λ=083°Ls), *DPc* took the morning

Syrtis Mj at ω=252°W. He processes the B plainly, and Syrtis Mj, though slightly bluish, but it is not so clear (perhaps due to the seeing condition).

DPk produced an excellent morning blue Syrtis Mj on 5 May (λ=086°Ls) at ω=257°W. In UV the Libya mist is so thick. In B also Syrtis Mj slightly visible but it is covered heavily by the morning mist. If the B images are composed with R and G, the white Syrits Mj becomes bluish.

Yukio MORITA (*Mo*) showed the blue Syrtis Mj when δ=4.7" on 1 Aug (λ=127°Ls) at ω=270°W when he described well the white morning mist in B: Syrtis Mj is bluish and misty in the composite RGB as well as in LRGB.

Unfortunately generally speaking in the case of the morning Syrtis Mj it is rare to find the work of procedures where the white mist is explicitly visible in the RGB images.

2° Blue-Greenish Morning Aspect of the Ætheria Dark Patch

On 3 Apr (λ=072°Ls) at ω=197°W, Sean WALKER (*SWk*) produced a very interesting set of images where the Ætheria dark patch, which is located to the further north of Syrtis Mj, varied to be blue-greenish at the morning side because of the presence of the white morning mist. It shows nearly a sky-bluish tint. It looks quite natural and the white mist appears not only in B but also in the RGB image. This as well proves that the morning mist caught in B causes the dark patch to be bluish. By chance, *DPk* also took the images at the same angle at ω=197°W on the day, and he also produced the morning mist in B and UV. However his ingredients form a much contrast to the cases of *SWk* so that the bluish tint is lessened but the white mist is most apparent in RGB. A conclusion is this: If the white mist covers the dark markings the markings become rather bluish or sometimes sky-bluish. Note thus that this is not the speciality of Syrtis Mj. It should especially be remarked that the morning mist is apparent in RGB.

However the case of *SWk* is quite a rare one, though if we scrutinise the images of *RGh* on 18 Feb (λ=054°Ls) at ω=186°W, we may find the case: the B image is good but the mist is weak.

On 19 Feb (λ=054°Ls), Pete LAWRENCE (*PLw*) at ω=182°W, and Ian SHARP (*ISp*) at ω=189°W may also show it slightly.

On the contrary, *RGh*'s images on 20 Feb (λ=054°Ls) at ω=172°W do not show this. Just Peter GARBETT (*PGb*)'s images on 20 Feb (λ=054°Ls) at ω=185°W may slightly suggest it. The distribution of the morning white mist on the day was traced by *DPc* at ω=184°W, 203°W, 208°W in B. It is late in time, but it looks *DPc* has little interest in the blue colour changing which is due to the white mist.

On 28 Feb (λ=058°Ls) at ω=186°W, 196°W, *WFl* took the very area, but the morning mist is not thick in B, so that the phenomenon is not clear in the composite.

On 1 Mar (λ=058°Ls) at ω=167°W, *PGc* produced a good B image with a slight mist, but the phenomenon on the RGB composite is not clear (or earlier in time?).

3° The Morning Mare Acidalium

Even if there is a morning mist at the terminator of the northern hemisphere, M Acidalium is stubborn in the sense it always shows its original colour. For example, M Acidalium on the pictures of *EMr* on 8 Feb (λ= 049°Ls) at ω=347°W or of *DPk*'s excellent images on 12 Feb (λ=051°Ls) at ω=335°W look quite normal in colour. Or we should say M Acidalium keeps away such a morning mist as we discussed hitherto as the B images suggest. *DPc*'s images on 14 Apr (λ= 078°Ls) at ω=010°W, 015°W shows the aspect where the southern part looks somewhat misty, while the covered part does not show any strange discolouration. *DPc*'s following images on 16 Apr (λ=078°Ls) at ω=345°W, 351°W, 357°W or on 17 Apr (λ=079°Ls) at ω=341°W, 345°W, 351°W show that the atmosphere is rather free from any thick morning mist.

Furthermore on *DPk*'s B image on 28 Apr (λ=083°Ls) at ω=330°W shows a morning mist at the

following terminator, whereas the coming-up M Acidalium itself is just dark.

On the contrary we come to find that on *Mo*'s RGB images on 16 June (λ=105°Ls) at ω=006°W, 011°W that the southern part of M Acidalium (around Niliacus L) has become bluish because of the strong morning mist. The angle must have been appropriate with the phase angle. From B we know the morning mist is thick at the southern part. Note however the northern main part of M Acidalium is usually dark: As is seen from B, the morning mist does cover the main part. This is so an important set of observations. This does not contradict the above fact that the main northern part is independent of the morning mist (as to when the morning mist turned to be stronger, we may suggest the time around λ=086°Ls (4 May) according to the observations of *Mo*). Of course *Mo*'s earlier sets on 5 Apr (λ=073°Ls) at ω=354°W, 004°W suggest a bit a blue variation of Niliacus L because of a weaker mist, but the original M Acidalium is independent.

4° Remarks

As we have seen the work above, we feel it to be important to choose the angles and the timing, and also the image processing is a decisive factor. In the ccd observation the B images should be shot well, and the rates of composite with other R and G must be careful. The careful processing of B image is very necessary to describe the equatorial band mist on the RGB image.

On the other hand, there has been employed the method to watch visually by the use of specrofilters. In the case of the blue filter, one has been recommended to use Wr#47: This has been used to check the so-called "blue haze" but it is dubious if we could integrate the original colour of the surface at the end: It is really difficult to check the presence of the white cloud and to construct its effect on the composite images inside the brain. Use of a lot of filters visually looks thus ridiculous. Rather it will be more useful to make the colour drawings of surface including the terminator and limb by using the integrated light.

In the older cases of the photographic observations, such as employed by E C SLIPHER, they used the filters but did scarcely integrate them into the colour images. So everyone is led to a lack of the imaginations how the Blue Violet image implies. The fact only provided a false idea of the presence of the "blue haze" and the white areas implied the "blue clearing" to them. Incidentally let us recall the dark Tharsis Montes in B poking out from the white mist sea treated in the preceding Note. Was this the result of the blue haze or the blue clearing?

In the Lowell Observatory, they nearly discarded the cases of aphelic oppositions (because they were meaningless in detecting canals) when the season was after the northern spring equinox, and so had lost an opportunity for considering the dark spot cases and could not abandon the long-standing false idea.

Thus far we here dealt with cases of the morning terminator side, but equally the evening limb (or evening terminator before opposition) is interesting, and hence we will treat the evening cases on another occasion. **Masatsugu MINAMI** (*Mn*)

Letters to the Editor

● *-----Subject: Mo 21 July_10*
Received: Thu 22 July 2010 01:23:01 JST

Processed tonight images (on 21 July) in a hurry. Because the seeing was very poor, I used *f*60 (usually *f*85~90).

○ *-----Subject: Mo 22 July_10*
Received: Sat 24 July 2010 01:01:34 JST

These are the images taken on the night of yesterday. The planet is now lower, and Mars is not bright. Since the high pressure atmosphere governs the Japanese islands, the seeing is rather good, but the colour of Mars appears strange, even after sev-

eral tries of processing.

○*-----Subject: Mo 23 July_10*
Received: Sat 24 July 2010 23:57:51 JST

Here is yesterday's set of images. Difficult to take the B image: The image is not bright in B and the seeing is poor. This time I took by 10fps. If we take the time longer, more influential is the seeing condition.

Today it was cloudy. From tomorrow they say it will not be so fine, but I should like to finish after taking Syrtis Major and Hellas.

○*----- Subject*: *Mo 01 Aug_10*
Received: Thu 05 Aug 2010 01:11:02 JST

I send a first set of images in August. Atmospheric condition was stable but the planet was quite low and the image was scarcely bright. I so used *f*60. I felt it difficult to take the B image but this is the best. There is no brightness near Hellas but the evening side is bright: this is also the same in B.

Recently the atmospheric condition is unstable in general: In the daytime, the temperature is about 35~36°C, while a cloud is apt to appear in the evening and we cannot long catch the planet. On the contrary the Jupiter shines well. It seems the Mars apparition has been coming to the end.

Hot days continue, and so I hope you will take good care of yourself.

○*-----Subject: Mo 06 Aug_10*
Received: Tue 10 Aug 2010 01:28:21 JST

I send the Martian image from 06 August. The images are poor, and beyond my processing. The surface correspond to the one with few markings. I have a mind to use a new camera called Flea3, maybe from the next apparition.

○*-----Subject: Mo 15, 16 Aug_10*
Received: Tue 17 Aug 2010 22:01:53 JST

I send here the Martian images on 15, and 16 August. Solis L was barely seen, while it is uncertain through the naked eye because the planet is quite low. By processing the evening mist is more evident. I met Takeshi (Ken) SATO on an occasion of a star meeting. He looked to feel well. He just said to me no more observers than the Japanese who observe Mars at present as it is now too small. He talked about the stars to the public, and they observed until 21 o'clock under his guidance.

Yukio MORITA (Hatuska-ichi, Hiroshima, Japan)

●*-----Subject: Martian feldspars?*
Received: Mon 26 July 2010 05:05:55 JST

This meassage may have been transmitted in a garbled fashion (out of sequence), so I'm taking the liberty of re-sending it...

Dear Masatsugu: I recently stumbled across a remark in a 1954 issue of the ALPO journal ("*The Strolling Astronomer*") that leads me to believe that feldspar crystals may be capable of accounting for a peculiarity of the Edom flares that you first pointed out nine years ago with keen insight. As you know, from the vantage point of the flare site, the Sun and the Earth would have been located very close to the zenith and separated by an angle of less than two degrees. The fact that flares are rarely seen led you to infer that that the sources of the reflections might be located at the bottoms of fissures. As you wrote back in 2001:

"Perhaps the reflection is not seen more frequently because the reflector is located inside a narrow trench… We can consider that the width of the trench is sufficient to allow a reflection of a beam of sunlight at vertical incidence, but too narrow to admit an inclined sunbeam. If the zigzagged walls of the trench are high, the flash would not be seen except around the time when De=Ds."

If feldspar crystals share a common orientation, the geometry required to produce a visible specular reflection would not require that they be located at the bottom of a narrow trench. During the early 1950s specular reflections were suspected of producing the fleeting, illusory appearance of a brilliantly illuminated central peak on the flat floor of the lunar crater Herodotus. One investigator, D.W. Rosebrugh, recalled an observation that he had made as a youth along the shores of Lake Huron when he proposed that lunar feldspars might be responsible:

"The coast is quite rocky and there are many feldspar faults, perhaps 30 feet wide and hundreds of

feet long in the granite and gneiss surface rocks which form most of the bare rocky shores. These feldspar faults are quite shiny if viewed from a suitable angle, but if viewed from other angles they

TEN YEARS AGO (180)

----CMO #234 (25 August 2000) pp2779~2794----

http://www.hida.kyoto-u.ac.jp/~cmo/cmo/234/cmo234.html

The first article of CMO #234 (25 Aug 2000) was written by *Mn* as "1998/99 Mars CMO Note (13)" and entitled "*A complex morning mist at the northern M Acidalium observed in late-May 1999 - compared with the phenomena in 1997*". This will be instructive in the coming apparitions.

This detection of a dark isolated area in M Acidalium was performed at Fukui and it was in pursuit on 29 May 1999 (λ=146°Ls) and on 30 May 1999 (λ=147°Ls). It was found when M Acidalium was appearing from the morning terminator being covering by a thick white cloud. The dark spot was seen through the cloud in an isolated manner, but gradually it turned out to be a part of M Acidalium. On 31 May (λ=147°Ls), and 1 August (λ=148°Ls) the morning cloud was weak and the isolated spot was not observed: See http://www.hida.kyoto-u.ac.jp/~cmo/cmo/note/9913/13.html

In Appendix, a similar phenomenon caught by the HST in 1997 (λ=139°, 146°Ls) and an observation of Don PARKER (*DPk*) in 1997 at λ=127°Ls are touched. Since, in 1999 on 27 Apr at λ=130°Ls, a cyclone was observed by the HST as well as by *Mk* and others, here is said that the attention should be paid to this area from around λ=130°Ls because the disturbance of the morning cloud should occur.

In #234 then *Mn* wrote about "MGS found lots of "JUVENTAE FONS"" on Martian surface, and introduced M C MALIN & K S EDGETT's "Evidence for Recent Groundwater Seepage and Surface Runoff on Mars" (*Science* 288 (2000) 2330). The following page was written in Japanese, but try to see an interesting illustration by *Ts* in http://www.hida.kyoto-u.ac.jp/~cmo/cmomn0/Bunken.htm

The Letters to the Editor (LtE) contains those from H TSUNEMACHI (*Ts*), H ISHADOH (*Id*), N MATSUMOTO (*Mt*), T AKUTSU (*Ak*), T AKABANE (hida), Y HIGA (*Hg*), Y MORITA (*Mo*) domestically as well as those abroad from W Y LAI (Taiwan), Damian PEACH (UK), Detlev NIECHOY (Germany), Giovanni QUARRA (Italy), Francis OGER (France), and Sam WHITBY (VA, USA). *Ts* informs that the Sun emitted one of the largest CME (Colonal Mass Ejection) during the period. She also wrote about the preparatory stage of the coming CMO Meeting at Yokohama.

The column TYA (60) written by *Mk* described about CMO #090 (10 Aug 1990) and CMO#091 (25 Aug 1990): Twenty years ago, Mars was at the western quadrature at Ari and shined brightly in the morning sky. At the end of July the season was λ=270°Ls. In mid-August the apparent diameter was over 10 arc seconds, and so the CMO published twice a month. During this period the spc was watched and its thawing and the brightness of the perimeter was noticed. In #090, there appeared a LtE from *Ak* who visited the Taipei City Observatory (in Japanese).


ISSN 0917-7388
COMMUNICATIONS IN 東亞天文學會『火星通信』since 1986
MARS No. 234
25 August 2000
OBSERVATIONS Published by the OAA Mars Section
1998/99 Mars CMO Note (13)
五月末のマレ・アキダリウム北部の朝霧
A complex morning mist at the northern M Acidalium observed in late-May 1999 compared with the phenomena in 1997
T NAKAJIMA's drawing on 29 May 1999 (146°Ls)
2779

In CMO#091, T ASADA (*As*) described about "*Apparent Disc Diameters versus Ls in 1984, 1986, 1988 and 1990/91)-Coming 1990/91 MARS (6)*" **(*Mk & Mn*)**

appear darker than the surrounding rock. At one time the writer picked up a small boulder of feldspar. From every direction it was a dull, dirty pink, but when held in a certain way it shone like a mirror. It was a little hard to see why, but an examination showed a myriad of tiny facets, all acting like mirrors, all pointing one way. These crystals shielded each other in part, so that the whole effect was confined to a narrow angle." Rosebrugh noted that "the crystal faces can only receive and transmit a rather narrow beam of light because each crystal partly shades its neighbor both with regard to incident and reflected light."

Source: D.W. Rosebrugh, "*Why the Light was Seen in Herodotus*" The Strolling Astronomer, Volume 8, Numbers 11 and 12 (November-December, 1954), 139-141.

Unfortunately, spacecraft like the Mars Odyssey orbiter are not capable of directly revealing the sources of the specular reflections because they obtain images under mid- to late afternoon lighting, not when the Sun lies directly over the underlying terrain. So the mystery of the Martian flares is only partially solved. While it would be foolish rash to insist that a single explanation has to account for all of the flares that have been observed, aligned crystals currently seem to be the best candidate to me. For now we can only take solace in the fact that partaking of the mysterious can be almost as gratifying as actually solving a mystery.

○-----***Subject: Ebisawa's drawings of Mars***
Received: Thu 12 Aug 2010 00:56:05 JST

Dear Masatsugu: I recently persused some drawings of Mars as seen through the 8-inch refractor of the National Science Museum in Tokyo by Shiro Ebisawa that were reproduced in Valdemar Axel Firsoff's book *THE WORLD OF MARS* (Oliver & Boyd: Edinburgh, 1969). These depictions of Mars, which remind me of the drawings of Jean-Henri Focas, are very realistic and testify to Ebisawa's great artistic skill. I was especially intrigued by his drawing of 20 August 1956 showing the yellow cloud emanating from Noachis that heralded the great dust storm. In that drawing Edom was outlined in a very narrow dark line that is very suggestive of the ramparts of the Schiaparelli basin. Other drawings that year show the "leopard skin" mottling, and many (but not all) of these discrete dusky spots correspond reasonably well to dark-floored craters on Inge's post Mariner 9 maps showing both albedo and topography.

I am prompted to ask if there were any remarks or discussion among Japanese Mars observers prior to the Mariner 4 flyby in 1965 about the possibility that the Martian surface might be extensively cratered. One often reads that this discovery came as a complete surprise, but Ebisawa's drawings depict features that are very suggestive of craters (at least in retrospect). I am aware that Saheki suggested that Mars was volcanically active on the basis of "gray clouds." During the 1950s the impact theory of crater origin was only beginning to gain widespread acceptance. Hence at that time volcanism might have implied Moon-like craters. Kind regards,

Tom DOBBINS (Howard, OH, USA)

●-----***Subject: Japanese name for ISMO***
Received: Thu 22 July 2010 22:46:27 JST

Dear Dr. Minami, Though any of the candidates you have enumerated would be OK for Japanese name of ISMO, I prefer “国際火星観測者協会”as it sounds most nice and natural.

PS: Attached is the same picture as with my latest e-mail except for some trimming and a larger image size. This day the temperature in Kyoto went up to 35°C or 95°F!…I was almost knokin'on Heaven's Door while my wife Reiko still had excess energy to try another mountain-top temple!!

○-----***Subject: Retroreflectors on Mars?***
Received: Mon 02 Aug 2010 01:58:31 JST

Dear Dr. Minami, How are you spending this hellatios oven like summer? I am convinced you've been still energetically doing well because the Declaration of Independence in the latest (and the last for CMO) issue was truly powerful as well as impressive! Within a matter of days I am submitting to

you a paper in wich I have tried to digest what you suggested on Martian Wine-Coloring Phenomenon in your latest personal web-lecture.

Thank you for your forwarding to me Tom Dobbins' e-mail. Along with his LtEs in CMO#374 his recent hitting the nail on the head ideas and stumbling across something findings were very much interesting. He quoted D. W. Rosebrugh's descriptions on the characteristic view-angle-related reflectivity changes of the feldspar faults and a boulder of the rock. Rosebrugh's close examination of the feldspar crystals leads me to imagine a configuration like "reflectors located deep within honeycomb cells." Each open end of the honeycomb cell shields inclined lightbeam to hit the tiny reflective facet to make the whole structure acting as a highly directional, greatly efficient reflector. However, it seems to me rather unlikely that there on Mars exist outcroppings of feldspar surfaces with myriads of tiny reflecting facets all pointing same direction over such a vast area.

Here I think I have stumbled across a possible candedate, "a natural retroreflector." A retroreflector is a surface that reflects light back to its source with a minimum scattering of light. You can find applications of artificial retroreflector every night— bicycle reflectors, road signs, safety clothings, etc. Transparent spherical or special shapes (e.g. corner cube) of crystals might possess highly effective retroreflectivity. And deposition or outcropping of such retroreflective substances may not require sufficiently flat terrain to make "a gigantic mirror" on Mars. Retroreflective surfaces combined with special topography (as your "narrow deep trench bottom reflector model") can explain Martian flaring phenomena, and their rarity as well.

Anyway, however, we currently don't have any way to directly reveal the sources of the specular reflections. We only hope some of the future Mars Landers prefer the right place as Edom Promontorium. Good Seeing with Excellent Scopes!

Reiichi KONNAÏ (Ishikawa, Fukushima, Japan)

●*-----Subject: Re: May I ask your favor?*
Received: Sun 08 Aug 2010 22:57:31 JST

Dear Masatsugu, I am not very early in sending my work - it has been difficult to choose a subject. Finally, I think I will propose you something about the brightening of Olympus Mons (OM) in 2005, as you asked me some monthes ago already. It will also be the occasion to use basic technic of analisis such as filter comparison so it will be of interest. Reviewing the data of the two next oppositions (2007 - 2010) it looks like the 2005 situation was truly exceptional. So just right now I'm still not going on the direction of the "opposition effect" theory. However I would be thankful to you if you could send me some theorical elements from this point of view - in term of geometry, would you except a mere surface brightening in 2005 as De was negative (south, while OM is in the north), and if we say that the Sun-Earth-OM alignement was better in the two following oppositions why didn't it shines? Maybe you can forward me some correspondances we already had - due to computer problems I have lost a great deal of e-mails over the last year. I will check CMO issues as well...

In the meantime, here are some next propositions of notes from my part.

They would be either from published work, but in french (of course data will be reviewed completely) or not published at all :

- Something about red surfaces observed in violet light
- The visibility of the NPC in 2007
- The aspect of the NPH at equinox time in 2007...

The last two could be part of a series turning around the NPR observations over the last apparitions. Best wishes,

°*-----Subject: ISMO*
Received: Thu 12 Aug 2010 02:35:29 JST

Dear Masatsugu, I'm encountering severe problems of informatic and I have lost all my recent e-mails including that one relative to the ISMO note. However I should be able to send you something by the week-end - much sorry for being that late:

Due to your remarks about the shining OM problem, I think we should belate the topic for a future issue. I would not have concluded definitely, but I'd have some interesting remarks. Because of the little remaining time, I will send a note about the red surfaces observed in violet light. It should be nice.

Best wishes

○-----***Subject: Mars note for the first ISMO issue***
Received: Mon 16 Aug 2010 00:10:27 JST

Hi friends, Here is my proposal of note for the first ISMO issue. It's taken from my 2005 mars report but has been completely revised. It's about some strange dark markings observed in violet light on Mars. The subject is not completely uncovered in my mind though - in any case opinions will be welcome, if ever you have some. Masatsugu, if needed I can still review the paper, of course.

Best wishes

Christophe PELLIER (Seine-St-Denis, FRANCE)

●-----***Subject: Re: Ebisawa's drawings of Mars***
Received: Sat 14 Aug 2010 00:59:07 JST

Dear Masatsugu, Thank you for cc:ing me on this. Very interesting. By the way, I just got back from Rhode Island, Massachusetts, and Vermont--participating in a Lunar Morphology Conference, where the TLP were discussed in quite lively terms and we got a preview of the surprising (and not yet published) results of LCROSS from Peter Schulz of Brown University) and Stellafane where I presented on Schiaparelli's observations of Mercury with John Boudreau. Before the meeting my host Dan Lorraine and I drove to Harvard, Amherst (where we saw the 18-inch refractor that was shipped to Chile with David and Mabel Todd in 1907), and Lowell. I had not realized that the 5.9 miles of canals in Lowell, which harnessed the water energy of Pawtucket Falls and the Merrimack River for textile factories, was the largest system of canals in the United States. Moreover, Bill Putnam, Percival Lowell's great-nephew and current Sole Trustee, told me that "Uncle Percy" was at one point treasurer of the Appleton mills in Lowell (founded 1838, and set between the Pawtucket and Hamilton Canals). "In those days," he writes, "the Treasurer of a Massachusetts corporation had to be elected by the shareholders directly, and not by the Board, thus the Treasurer was the real authority in many Massachusetts companies." I have sometimes wondered whether--perhaps unconsciously--the canals at Lowell and the technocratic group (the Boston Associates) who built the textile industry around them didn't serve as a model for Percival's vision of a canalized Mars.

Perhaps I shall attempt to develop this idea further for the International Society of Mars Observers' journal. Bill Putnam has been a wonderful source of insider information about the Lowells.

There is an interesting recent book on the harnessing of water power at Lowell: Patrick M. Malone, "*Waterpower in Lowell: engineering and industry in nineteenth century America*" (Baltimore: The Johns Hopkins University Press, 2009). There is, of course, much more interest in the sociological aspects of the exploitation of female workers ("bobbin' girls") in the textile mills in Lowell and Lawrence; the latter was of course the scene of the big 1911 strike, which was finally broken up by the authorities. Nowadays, of course, the factory infrastructure and manufacturing base in New England is all but gone; the mills have been closed, not only in Lowell and Lawrence but in Springfield, Vermont, where Russell Porter worked as a machinist--many of the old

red brick factories are melancholy ruins, resembling the windowless hulks of a bombed city; though

some, especially in Lowell, are being restored for condominiums and retail centers. Unemployment rates are staggeringly high.

One last report from my recent travels: I was able to visit 70 Heath Street, Brookline, which is of course "Sevenels" where Percival lived for many years and on the roof of which he first set up his small refractor and observed Mars about 1870. I attach an image of it for your possible interest.

Best,

°-----***Subject: Lowell's canals***
Received: Sat 14 Aug 2010 01:04:08 JST

Hi, Masatsugu and Tom, Attached see one of the textile factory buildings and a canal at Lowell.

°-----***Subject: Re: Mars note for the first ISMO issue***
Received: Mon 16 Aug 2010 00:20:50 JST

Hi, Christophe and Masatsugu, Good paper -- thanks, Christophe. Give me a few days to put it into idiomatic English, then we can proceed with publishing it in the first ISMO issue. Best to both,

°-----***Subject: The peculiar reddish features on Mars***
Received: Wed 18 Aug 2010 08:42:10 JST

Dear Christophe and Masatsugu, I have enjoyed reading Christophe's valuable paper on the reddish features of Mars, and learned a great deal from it. I think it is an excellent article to lead off the new ISMO series.

I have tried to render the article into idiomatic English without, I hope, doing any injustices to what is intended. I hope both of you will peruse the result to make sure that nothing of substance has been altered.

In doing this, I began to ask myself about other articles that might be published in ISMO, and perhaps how the series can develop. I would like to perhaps see, as a follow-up, a general article on color vision as it relates to Mars (as well as the other planets). It might be worth reprinting the article I wrote about my observations of colors at Lick in 2003, which discusses some of the complications of visual color estimates; even more valuable would be Andy Young's rather lengthy article on colors and the planets, which was submitted to Icarus but too provocative for them to publish, but is a great resource. I shall ask him if he would grant us permission to use it.

I would like to see some of the more seminal articles in the CMO series perhaps reintroduced—for instance, Masatsugu's article on the various aspects of Olympus Mons and the Tharsis volcanoes, which interests me a great deal because of its relation with the famous observations of Schiaparelli and Barnard. Perhaps I could also work these up into the best English syntax.

***A few other matters: I am going to present on Schiaparelli's observations of Mercury in the light of recent CCD imagery by John Boudreau in Turin and Milan next October, for the celebration of Schiaparelli's legacy on the occasion of the centennial of his death. Are you thinking that the ISMO is going to only concern itself with Mars observations or with other matters peripherally related to Mars — such as the Lowell travels to *Noto* or the Schiaparelli observations of Mercury. I am also hoping to visit Paolo Tanga in Nice, who as you know has a keen interest in the work of Perrotin.

Anyway, I am glad to see such an excellent in

augural article by Christophe leading the way to ISMO which I believe will soon become the leading journal of serious amateur (and some professional) devotees of the Red Planet.

°-----***Subject: Schiaparelli the color-blind astronomer***

Received: Wed 18 Aug 2010 09:06:23 JST

Dear Masatsugu, Now that I have read Christophe's interesting paper, I am wondering if it might not be of interest to publish—on this occasion of the hundredth anniversary of the death of Schiaparelli (July 4)--a version of my article, "The Color Blind Astronomer," which discusses Schiaparelli's color-blindness and some differences in the perception of planetary detail of a color-blind vs. a normal observer of Mars. There are some analogues in radiology; though some kinds of information are best displayed in terms of color, others—especially very small features—are better revealed in grey-scale.

It is important, in the case of a planet like Mars where color vision provides low-resolution spectrophotometric information about candidate materials for planetary surfaces that is comparable in precision to wideband photoelectric photometry and considerably superior to Viking and Voyager TV data—and where the use of filters is indispensable to many particular investigations—to realize that most scientists (and certainly most non-scientists) know much less about color than they think they do. Partly this is because of the physical scientist's habit, as Andy Young has written, "of externalizing reality. Thus, many of us wrongly assume that color is a property of electromagnetic radiation, rather than of the human visual system. But color really lies within the observer, and not 'out there.'" Already Newton realized that "if at any time I speak of Light and Rays as coloured or endued with Colours, I would be understood to speak not philosophically and properly, but grossly, and according to such Conceptions as vulgar People ...would be apt to frame. For the Rays to speak properly are not coloured. IN them there is nothing else than a certain Power and Disposition to stir up a Sensation of this or that Colour."

***

I have some other ideas for contributions to ISMO. I would like to present a paper outlining the discovery of the first Mars-encircling (according to McKim) or global (according to Minami) duststorm in the historical record; observed by Trouvelot early in 1877 long before other observers such as Flammarion, Hall, Green, and Schiaparelli began their studies of the planet.

Also I think it would be of interest to show that there is nothing to the idea that possible changes in dust storm activity of Mars indicate "global warming" on that planet to parallel that of the Earth. The Martian changes in dust storm activity can be ascribed to the shifting of albedo features and a "blackening" of areas of the surface following the Great Dust Storms of the early 1970s. The climate change on Earth is different; I get tired of repeating to "skeptics" (most of whom have very little understanding of physics, meteorology, oceanography, etc.) that the Earth's climate is a relatively stable system—and has been for many thousands of years (though variable). CO_2 and other greenhouse gases (methane) is trapping more energy in the system, and if you add energy into a stable system, you get instability as it changes state. (I think a somewhat fanciful example of this is adolescence!) Whether this makes things hotter in one place or colder in another is beside the point; the point is that it's not going to lead to what we're used to, it's not going to resemble the climate regime we've experienced during the time civilization was being built, and you can bet that rapid change on the scale that is taking place is not going to do us any good.

°-----***Subject: Re: Thank you!***

Received: Wed 18 Aug 2010 20:04:45 JST

Dear Masatsugu, I wrote to my friend Andy Young, whom you would have met when I drove down to Mt. Wilson in 2005--if you had survived the harrowing journey with the babbling Brit. He is an expert on planetary colors (and just about any

thing having to do with optics). He wrote a very nice article that is comprehenisve and it is on his web page. As you see from the text below, he gives us permission to use it in any way we wish.

Take a look and see if some excerpts of this may not be appropriate for ISMO.

Looking forward to seeing Christophe's fine article in print. Best,

> filters leads me to recall your paper originally
> planned for *Icarus*; which as far as I know has
> never been published. I don't know what your
> plans for it are; however, I think that it would be
> useful to the handful of ISMO readers to have
> access to it, and would hope you would at least
> consider allowing its publication (though the
> copyright notice will be displayed and you will
> retain all rights to it). When I read it, it was a
> revelation; I have never thought about planetary
> colors the same way since.

It's on my Web pages at
http://mintaka.sdsu.edu/GF/explain/optics/color/color.html
Feel free to make whatever use of it you think would be best. **Andy YOUNG**

Bill SHEEHAN (Willmar, MN, USA)

§ § §

***Autumn*:** It is very hot this year at present, and several kinds of cicadas are still a lot chirping noisily.

MATSUO Basho (1644-1694) once composed a (5+7+5 =)17-syllable poem (*haiku*),

Shi_zu_ka_sa ya
i_wa ni si_mi_i_ru
se_mi no ko_e

This was translated by Donald KEENE as

Such stillness------
The cries of the cicadas
Sink into the rocks.

Note that every haiku contains a sign of the season, and here *semi=cicadas* implies the summer. However at present no haiku poet does compose any haiku of summer because from 7 August (λ=135°Ls on the Earth) the autumn has begun. In Japan (maybe also in China) from λ=135°Ls to λ=225°Ls, the season is autumn, and the autumnal equinox (λ=180°Ls) is mere the centre in the autumn. Haiku poets are very strict on this point, and so the haiku they write now contain the signs of autumn. They neglect the heat of the lingering summer. The morning-glory is a sign of autumn. We celebrate the Full Moon on 22 September this year as the mid-autumn moon. The Moon is thus autumnal. (*Mn*)

C_M_O Fu_Ku_I

T NAKAJIMA (*Nj*)

★We are very grateful to Reiichi KONNAÏ (439) and Tatsujiro MATSUMOTO (440) for their kind and generous donations to us on this occasion of the start of the new Society (ISMO).

International Society of the Mars Observers (ISMO)

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

Bulletin: Kasei-Tsûshin CMO (**http://www.mars.dti.ne.jp/~cmo/ISMO.html**)

CMO #375/ ISMO #01 (25 August 2010)

Editorial Board: **Tadashi ASADA, Masatsugu MINAMI, Masami MURAKAMI, Takashi NAKAJIMA and Akinori NISHITA**

☆ *Any e-mail to CMO/ISMO is acknowledged if addressed to*

cmo@mars.dti.ne.jp (Masami MURAKAMI at Fujisawa)
vzv03210@nifty.com (Masatsugu MINAMI at Mikuni-Sakai)

☆ *Usual mails to CMO/ISMO are acknowledged if addressed to*

Dr Masatsugu MINAMI, 3-6-74 Midori-ga-Oka, Mikuni, Sakai City, Fukui, 913-0048 JAPAN