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Forthcoming 13/14 Mars (5)

How about in 2014 Such Cyclones near Baltia Which was Chased in 1999?

By

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Introduction

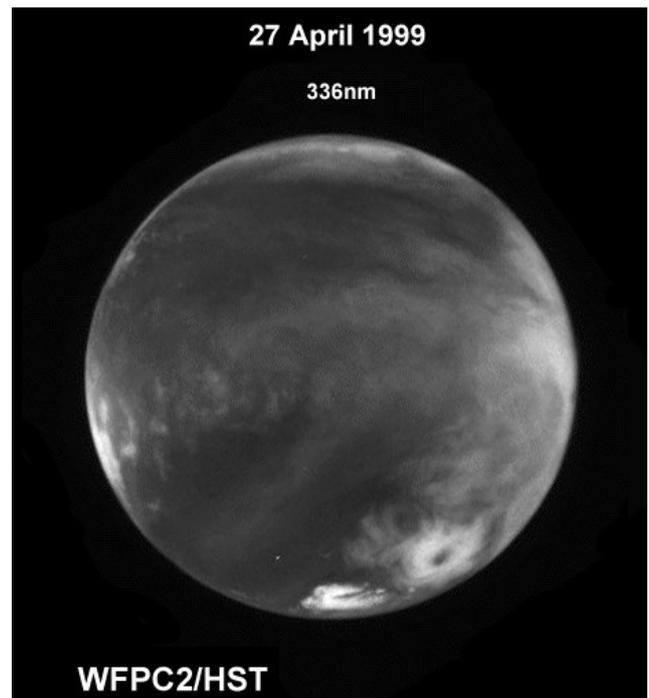
The forthcoming apparition of Mars in 2014 is a 15 year recurrence of the apparition of Mars in 1999 when a conspicuous white cyclonic cloud appeared following M Acidalius at the end of April 1999. The image → was the one produced by the HST and published in usual Newspapers. As to an episode occurred at the rooftop of the Fukui City Observatory, 1998/99 CMO Mars Reports #11 in CMO #218 (25 May 1999) reported:

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn0/99Repo11/index.htm>

Let us cite a bit from the Report:

"The image press-released was a B image, and hence it might be difficult to judge the place it occurred, but a glance at the direction of Chasma Boreale inside the npc could readily makes us be aware that the place was Baltia. The image was taken by the WFPC2 on 27 Apr (130°Ls) during a visit from 17:55:38 GMT to 18:51:12 GMT."

The duration of shooting continued about one hour. The image on the right-



hand side is the one taken by a shorter wave of 336nm, and cited from <http://marswatch.tn.cornell.edu/hst99.html>

This web site shows several images taken from the wavelength 255nm to the longest one 1042nm. The cyclone however shows up clearly explicit only until around 600nm. Although it can be pinned down on any R image, the cyclone on any

R and IR images looks smaller than on B images. This is because the cyclone was made of water vapour. This may imply that any visual observation of the cyclone by the naked eyes would depict it smaller because usual eyes work for longer wave lengths.

By the way, the upset at the dome of the Fukui City Observatory when the news on the Newspaper was brought was described by one of us (*Mn*) in CMO #227 1998/99 Mars CMO Note # 03:

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmo/note/9903/03.html>

"One evening in mid-May, NAKAJIMA (Nj) came up to the Observatory bringing with a Newspaper which showed a Martian surface with a strange cloud patch taken by the HST on 27 April. The photo was a blue-light one, and hence there was no appealing dark marking (or almost all were dark) and so the place was puzzling at first. But soon we noticed the position of Chasma Boreale, and came to know that the true position was near Baltia. And finally we gave a shout on the rooftop: It's just MU-RA-KA-MI! Later we were informed that Mk and HIGA (Hg) also readily pinned down the place. The record by the HST was partly cited in CMO 218 (25 May 1999) at p2524."

The reason why the name of MURAKAMI (*Mk*) was popped out was because both *Nj* and *Mn* had actually met with *Mk* and other CMO members at Fukui at the beginning of May. As to the episode at the Conference, the Note also communicates as follows:

"When we met at Fukui at the beginning of May 1999 on the occasion of the 7th CMO Planetary Meeting, MURAKAMI (Mk) asked all whether we had observed an extraordinary morning bright patch to the north of M Acidalium at the end of April 1999 as he

checked. ISHADOH (Id) and IWASAKI (Iw) responded confirmatively, and MINAMI (Mn)'s drawings were not contradictory."

27 April 1999 by the OAA Mars

On 27 April 1999, in addition to *Mk*, Tohru IWASAKI (*Iw*) observed visually the white cloud near the terminator.

The last observation on the day of *Mk* was on 27 April at 16:10 GMT at $\omega=351^\circ\text{W}$.

Since the HST started at 17:56 GMT on the day, *Mk* was late just by one hour and 46 minutes. In the case of *Iw*, the last observation was made earlier at 14:10 GMT, and hence the separation was 3 hours 46 minutes. In Japan, at the time of the HST was at work, the planet was beginning to decline to the west. And hence it is dubious whether *Iw* checked the movement of the bright spot from the terminator. In the case of *Mk*, as shown below on his Figure, the growth of the white cloud as it enters into the late morning area. At any rate it was a good opportunity to chase the rudimental white morning cloud just before the HST started.

The OAA Observations on 27 April are made as follows:

Iw-047D	$\omega=302^\circ\text{W}$	(at 12:50 GMT)
Id-054D	$\omega=304^\circ\text{W}$	(at 13:00 GMT)
Iw-048D	$\omega=312^\circ\text{W}$	(at 13:30 GMT)
Mk-113D	$\omega=312^\circ\text{W}$	(at 13:30 GMT)
Iw-049D	$\omega=322^\circ\text{W}$	(at 14:10 GMT)
Mk-114D	$\omega=322^\circ\text{W}$	(at 14:10 GMT)
Mk-115D	$\omega=332^\circ\text{W}$	(at 14:50 GMT)
Mo- C	$\omega=336^\circ\text{W}$	(at 15:10 GMT)
Mk-116D	$\omega=341^\circ\text{W}$	(at 15:30 GMT)
Mk-117D	$\omega=351^\circ\text{W}$	(at 16:10 GMT)

The white patch was explicitly apparent since around the angle $\omega=312^\circ\text{W}$ (Iw-048D

and Mk-113D).

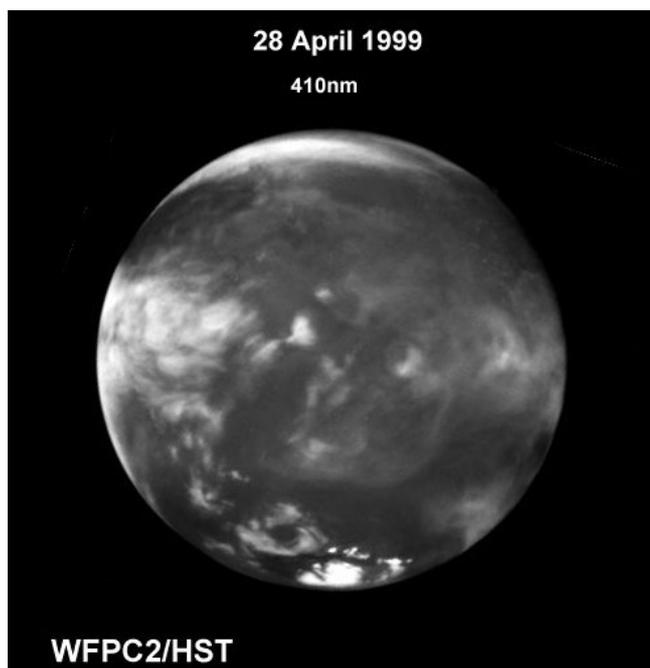
Here *Id* is the code of Hiroshi ISHADOH, and *Mo* of Yukio MORITA. *Mo* at that time used a Nega Colour Fuji



film ASA100. Here his image is shown; the white patch was coming.

As explicitly checked later, the weather on the days at Fukui was unfortunately dismal.

On the other hand, after the activity of the HST at the morning Baltia, since the time was around 19h GMT, it was expected for the European observers to observe the aftermath, but no news arrived. The HST was still at work at midnight GMT from 00:22 GMT to 01:17 GMT on 28 April 1999 and produced the comparative set of images ranging from deep B to IR.



In fact the cyclone, though becoming

weaker, was still shot, and here is shown the B image by 410nm taken on the early morning of 28 April GMT. Judging from the image we can say there might have been some opportunity to check it from the European side.

On 26 April 1999

Then we should be concerned with the case on the preceding day. In the Report above cited: CMO #218 (25 May 1999) 1998/99 Mars Observation Reports - #11-

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn0/99Repo11/index.htm> we can find the following description:

As to the observations of Mk on 26 April, we reported as follows in CMO#217 (10 May 1999) at p2501:

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmo/217/cmo217.html>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn0/99Repo10/index.htm>

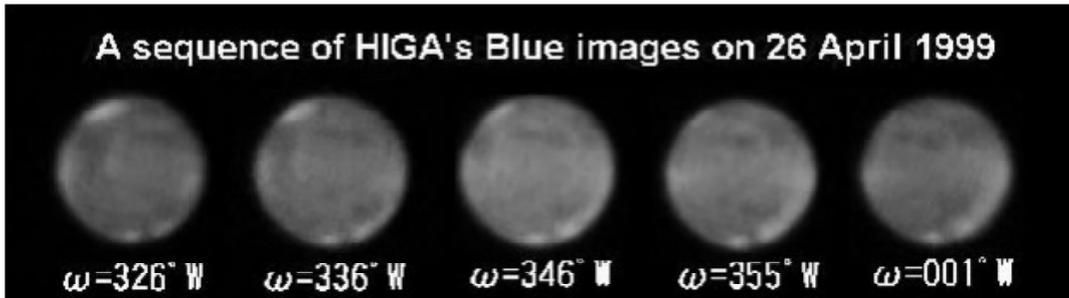
"MURAKAMI (Mk) noted on 26 Apr (130°Ls) at ω=326°W ~ 355°W that the morning area of Baltia between M Acidalium and Hyperboreus L was thickly misted. Iaxartes was detected preceding the morning mist."

In fact, it was because *Mk* checked the moving white patch on 26 April that he was urged to do similarly on the following night on 27 April.

The OAA observations on 26 April were performed as follows:

Iw-044D	ω=311°W	(at 12:50 GMT)
Hg-426-1V	ω=316°W	(at 13:13 GMT)
Iw-045D	ω=321°W	(at 13:30 GMT)
Id-053D	ω=321°W	(at 13:30 GMT)
Hg-426-2V	ω=326°W	(at 13:52 GMT)
Mk-109D	ω=326°W	(at 13:50 GMT)
Mk-110D	ω=335°W	(at 14:30 GMT)
Hg-426-3V	ω=336°W	(at 14:32 GMT)

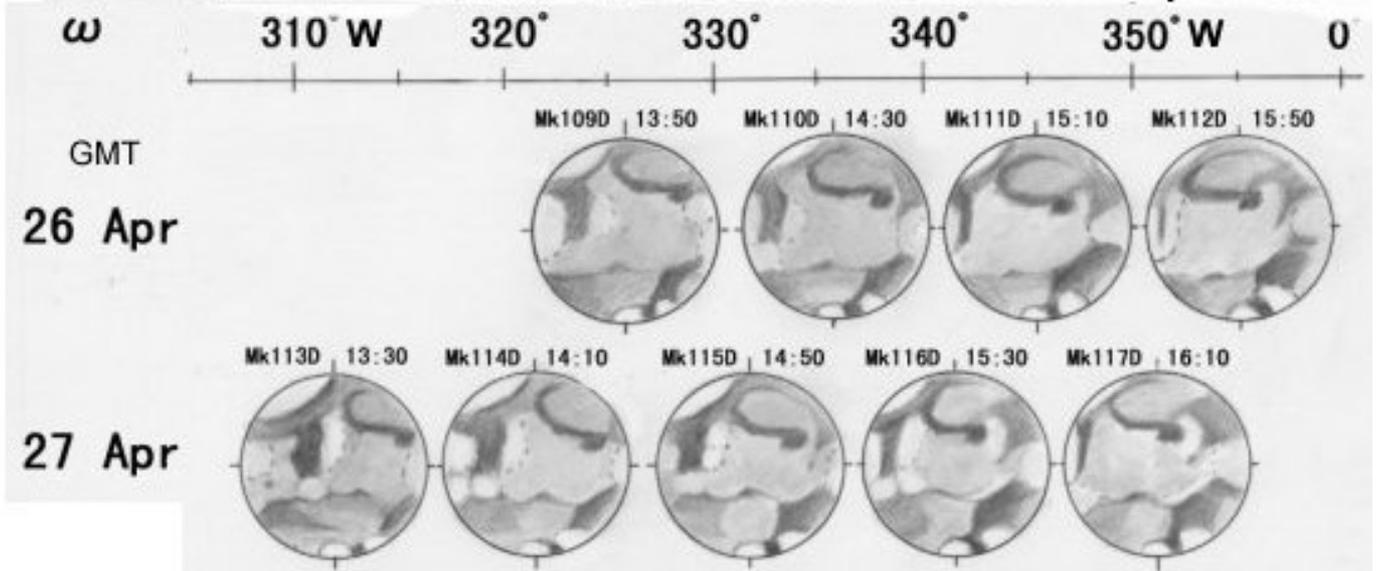
Hg-426-4V	$\omega=346^\circ\text{W}$	(at 15:13 GMT)	Hg-426-6V	$\omega=001^\circ\text{W}$	(at 16:18 GMT)
Mk-111D	$\omega=345^\circ\text{W}$	(at 15:10 GMT)			
Mo- C	$\omega=350^\circ\text{W}$	(at 15:30 GMT)			Here is shown a set of B images
Hg-426-5V	$\omega=355^\circ\text{W}$	(at 15:53 GMT)			taken by Yasunobu HIGA (<i>Hg</i>) on 26
Mk-112D	$\omega=355^\circ\text{W}$	(at 15:50 GMT)			April.



Similarly we here cite the drawing sets on 26 April as well as on the preceding 27 April made by *Mk* and *Iw*. It should be remarked that on the case of

Mk, the white cloud is shown to move towards the inside of the disk. The drawings by *Iw* are shown at the following page.

Masami MURAKAMI's observations of Baltia on 26 and 27 April 1999



How about was further before 26 April?

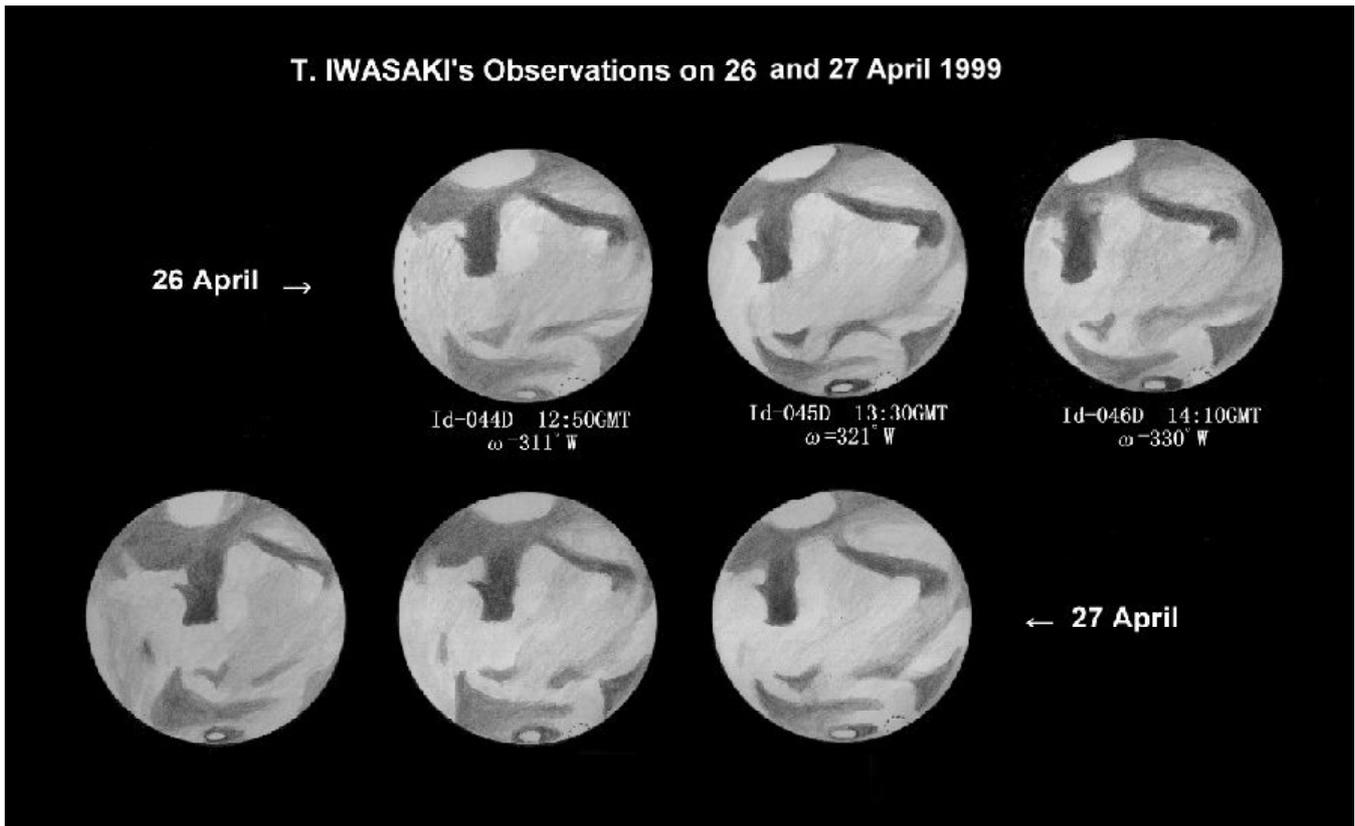
The observations before 26 April were reported in the CMO 1998/1999 Note - 03 -(in CMO #227)

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmo/note/9903/03.html>

On 25 April ($\lambda=129^\circ\text{Ls}$), *Id* and *Hg* at Okinawa observed as follows:

Hg-425-1V	$\omega=322^\circ\text{W}$	(at 13:00 GMT)
Id-048D	$\omega=327^\circ\text{W}$	(at 13:20 GMT)
Hg-425-2V	$\omega=332^\circ\text{W}$	(at 13:40 GMT)
Id-049D	$\omega=337^\circ\text{W}$	(at 14:00 GMT)
Hg-425-3V	$\omega=341^\circ\text{W}$	(at 14:20 GMT)
Id-050D	$\omega=349^\circ\text{W}$	(at 14:50 GMT)
Hg-425-4V	$\omega=351^\circ\text{W}$	(at 15:00 GMT)
Id-051D	$\omega=359^\circ\text{W}$	(at 15:30 GMT)

T. IWASAKI's Observations on 26 and 27 April 1999



Hg-425-5V $\omega=001^{\circ}\text{W}$ (at 15:42 GMT)
 Id-052D $\omega=008^{\circ}\text{W}$ (at 16:10 GMT)
 Hg-425-6V $\omega=010^{\circ}\text{W}$ (at 16:20 GMT)
 Hg-425-7V $\omega=020^{\circ}\text{W}$ (at 17:00 GMT)
 Hg-425-8V $\omega=030^{\circ}\text{W}$ (at 17:42 GMT)
 Hg-425-9V $\omega=039^{\circ}\text{W}$ (at 18:15 GMT)

As to the observations on 25 April, the Report describes as follows:

"The first $\omega=322^{\circ}\text{W}$ was the one standard on 26 and 27 Apr. The image by Hg at $\omega=322^{\circ}\text{W}$ does not show so clearly the mist, while Id's drawing at $\omega=327^{\circ}\text{W}$ shows the morning light mist. The image by Hg at $\omega=351^{\circ}\text{W}$ shows Hyperboreus L dark and to its south a morning mist. At $\omega=010^{\circ}\text{W}$ by Hg, the morning mist is bright, though Id drew it weaker at Id-052D. Hg's image at $\omega=020^{\circ}\text{W}$ shows it to be round and still thick but the cloud looks to remain near the terminator. At $\omega=030^{\circ}\text{W}$, the morning patch seems to have retarded from the area of Baltia, and even at $\omega=039^{\circ}\text{W}$, it is not so inside the disk.

If we compare it with the one in HST's images on 27 Apr at $\omega=017^{\circ}\text{W} \sim 030^{\circ}\text{W}$, we can say the cyclone, if exists, looks very weak or not to have been produced on 25 Apr."

On 24 April ($\lambda=129^{\circ}\text{Ls}$) there were observed also by Nj and Mn in addition to Id, Hg as noted as follows. Taking these into account we may say that the tide turned around 24 or 25 April 1999:

"Baltia area was free of any thick mist at $\omega=010^{\circ}\text{W}$ (15:40 GMT, by Mn) where Iaxartes and the following canal were visible (Mn observed on the day at $\omega=338^{\circ}\text{W}$, 348°W , 358°W and at $\omega=010^{\circ}\text{W}$). This implies that the morning mist patch which became thicker and stronger from around $\omega=010^{\circ}\text{W}$ must have been rather absent on 24 Apr. "

(At this place we here describe the weather condition Nj and Mn met at Fukui at the end of April: It was possible to observe though sometimes cloudy on 20, 21, and 22 April while it rained on 23 April, and just observable with a lull on 24 April and it rained lightly on 25 April. On 26 April we stayed at

the observatory but it was totally cloudy. On 27 April it was also cloudy. It was rainy on 28 April. Just it became fine on 29 and 30 April. *Mn* observed ten times on 29 April and 11 times on 30 April.)

How about the opposite days after 27 April?

While there exists one drawing by *Iw* on 28 April at $\omega=313^\circ\text{W}$ as well as a photo by *Mo*, no systematic study is possible. There issued several observations on 29 April ($\lambda=131^\circ\text{Ls}$) which were reported as follows:

"However even the last observation by Mk was at $\omega=314^\circ\text{W}$, and so further angles were already beyond his scope. Mn watched ten times on the day, and saw the morning mist from $\omega=299^\circ\text{W}$, and the mist became thicker at $\omega=329^\circ\text{W}$ along the terminator upto the further south, but it did not much come into the disk even at $\omega=358^\circ\text{W}$. We may consider therefore that, compared with the results by Mk and others on 27 Apr, the mist must have not developed so much on 29 Apr."

At that time, the area already went to Europe. Among a few reports we received, there is one set of images made by André NIKOLAI (*ANk*) at Berlin on 29 April 1999 at $\omega=050^\circ\text{W}$ by the use of a 15cm refractor of the WFS. It nicely contains a B image, but since the image is smaller we cannot judge about the following area of M Acidalium. On the other hand, at Norfolk, England, Damian PEACH (*DPc*) produced several images by using a 31cm Meade on 29/30 April, but unfortunately there was not found any B image.

When is it possible to observe the cyclone-like white patch near Baltia in 2014?

It goes without saying that we need much more data about such a phenomenon we met in late-April 1999 to analyse the meteorology around M Acidalium.

At any rate the above description tells us that we should first of all be attentive to the area of Baltia at the season around $\lambda=130^\circ\text{Ls}$. In fact, as will be shown in the following Appendix, already in 1997 Don PARKER (*DPk*) clearly showed that the Baltia area had a white morning cloud at $\lambda=127^\circ\text{Ls}$. And hence it is highly possible for us in 2014 to encounter with the cyclone-like white cloud at this season in similar way.

So here, picking up $\lambda=130^\circ\text{Ls}$ in 2014, we here want to show when and where the opportunity could come to our hands.

The season will come in May 2014. Since it is after the opposition day, planet will shine from the evening.

In Japan, at the beginning of May, the planet will be at meridian at around 21h JST (12h GMT) and for example on

10 May ($\lambda=129^\circ\text{Ls}$) at 21h JST the surface will show $\omega=348^\circ\text{W}$, and hence we should look for other possible days from this standard. The angular diameter is then $\delta=13.7''$, and the phase angle is $\iota=24^\circ$.

In Europe, the planet will be at the meridian at around 20h GMT in mid-May, and as an example on 22 May ($\lambda=135^\circ\text{Ls}$) at 21hGMT the surface of $\omega=341^\circ\text{W}$ is observable with $\delta=12.6''$ and $\iota=30^\circ$.

Finally in the US, one should guess the opportunity from following suggestions: The planet will pass the meridian in late-April at 22h EDT (03hGMT) and on 24 April ($\lambda=121^\circ\text{Ls}$) at 22h EDT the surface will show the disk at $\omega=343^\circ\text{W}$ with $\delta=15.0''$ and $\iota=13^\circ$.

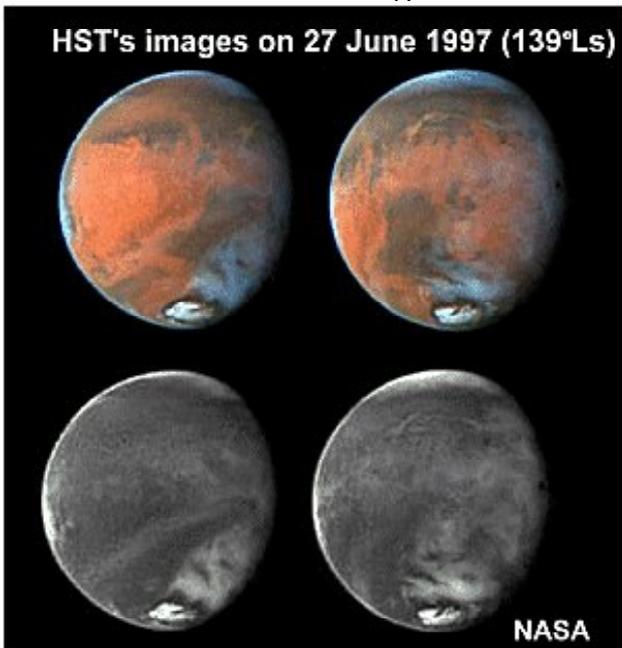
Appendix and further outlook

As above mentioned, *DPk* issued a nice

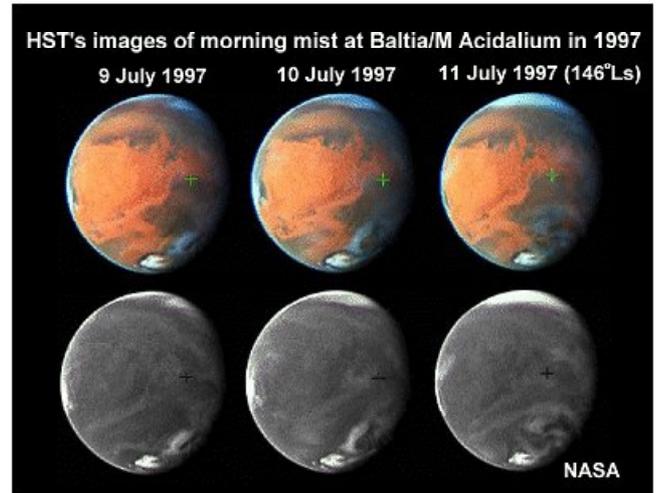


observation of the Baltia cloud on 3 June 1997 ($\lambda=127^\circ\text{Ls}$): This looks sufficiently bright and possibly was an appearance of a cyclone.

We should further note that the HST in 1997 issued several images with white



cloud or mist at the northern higher latitude area. The seasons are respectively at $\lambda=139^\circ\text{Ls}$ and at around $\lambda=145^\circ\text{Ls}$.



Let us also note that in 1999 at the season $\lambda=167^\circ\text{Ls}$, *Mn* obtained a series of drawings where a thick morning cloud occupying over M Acidalium. Here are shown three out of the series.



In this case the terminator was seen at the morning side, so that it shows how the morning cloud developed before dawn and then how it came into the bright disk. The season was quite late, and in 2014 the season will come on around 25 July 2014 while the angular diameter will be under $10''$.

Conversely speaking, the catch of the white morning cloud patch or its rudiment can possibly give rise to in any seasons at the northern higher latitudes before *maybe* $\lambda=100^\circ\text{Ls}$. In fact, as was described in CMO #184 (10 Feb 1997) Viking Orbiter-1 observed

twice the arctic cyclones already at $\lambda=105^\circ\text{Ls}$ and at $\lambda=126^\circ\text{Ls}$ and so the younger seasons need also to be attentive. As to the Viking cases see

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmo/184/cmo184.html>

An analysis of the arctic cyclones found by VO-1 was given by Garry E HUNT and Philip B JAMES, *Nature* 278 (1979) 531. □

CMO/ISMO 2013/14 Mars Report #02

2013/2014 Mars Observations in October 2013

♂..... This is the second report in this apparition, and deals with the Mars observations made during the one-month period of October 2013: The season ran from $\lambda=029^\circ\text{Ls}$ to $\lambda=043^\circ\text{Ls}$. The angular diameter δ of the planet increased from $\delta=4.4''$ to $\delta=4.8''$. The tilt declined from $\varphi=21^\circ\text{N}$ to $\varphi=24^\circ\text{N}$; where the northern hemisphere and the north polar region were largely facing towards us. The phase angle ι increased from $\iota=26^\circ$ to $\iota=31^\circ$ with a large defect of illumination at the evening side, and the area of the morning hemisphere looked lessened. In October the planet proceeded in the constellation Leo: Regulus shined side by side with Mars. From the beginning of October the comet ISON was near Mars, and on 1 October the comet approached Mars upto 0.07AU, and moved to the inside of the Martian orbit.

Some new Mars observers joined. Notably Yukio MORITA (*Mo*) tried to observe many times, despite the approaches of Typhoons twice in one month.

♂..... During the October period we received the ccd enviable observations from the following observers: Every image is appreciated in

http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2013/f_image.html

AKUTSU, Tomio (Ak) Cebu, the Philippines

1 Set of RGB + 1 IR Image (18 October 2013) 36cm SCT @f/24 with a DMK21AU618AS

GHOMIZADEH, Sadegh (SGh) Roudehen, Iran

2 Colour + 1 B Images (17, 25 October 2013) (28cm SCT with a DMK21AU04.AS)

GORCZYNSKI, Peter (PGc) Oxford, CT, the USA

1 Set of RGB + 1 IR Images (19 October 2013) 36cm SCT with an ASI 120MM

MELKA, James T (JMI) Chesterfield, MO, the USA

1 Colour + 1 R + 1 B Images (27 October 2013) 45cm spec with a DBK21AU04.AS

MORALES RIVERA, Efrain (EMr) Aguadilla, Puerto Rico

1 Set of LRGB Images (7 October 2013) 31cm SCT with a Flea3

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

12 Sets of RGB + 12 LRGB Colour + 12 L Images (1, 12, 13, 16, 20, 27, ~31 October 2013)
36cm SCT with a Flea3

PARKER, Donald C (DPk) Miami, FL, the USA

1 Set of RGB Images (10 October 2013) 41cm Spec @f/26 with an ASI 120MM

PEACH, Damian A (DPc) Selsey, West Sussex, the UK

1 Set of RGB Images (6 October 2013) (36cm SCT with a SKYnyx 2-0M)

♂..... Yukio MORITA (*Mo*)'s set of images made on 1 Oct ($\lambda=030^\circ\text{Ls}$) at $\omega=360^\circ\text{W}$ was excellent despite

the small angular diameter $\delta=4.4''$: Aram is described light between S Meridiani and S Margaritifer. It is a bit tasteful for the head of S Sabæus to look connected with the opposite bank of S Margaritifer. Oxus looked spotted, and its following narrow area between M Acidalium looks light. M Acidalium appears to hold a dusty area at the north-eastern (NE) corner. In R, the triangular WN corner of M Acidalium is dark apparent. Achillis Pons is faintly recognised. The north polar cap (npc) is brilliant while the perimeter looks blurred. The southern end of the image is dimly light.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2013/131001/Mo01Oct13.jpg>

On 6 Oct ($\lambda=032^\circ\text{Ls}$), Damian PEACH (*DPc*)'s set of images at $\omega=091^\circ\text{W}$ shows explicitly Solis L in the evening, with accompanied by Agathodæmon, and such spots as Phoenicis L stay separated like beads. The evening Xanthe looks misted in B. The npc is clearly shot; maybe at its best at $\phi=22^\circ\text{N}$. There may be followed a few large misty patches from Tempe. The southern limb looks blurred.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2013/131006/DPc06Oct13.jpg>

On 7 Oct ($\lambda=032^\circ\text{Ls}$), Efrain MORALES (*EMr*) worked at $\omega=141^\circ\text{W}$, but it looks he is not got ready. Description is not sufficient including the image of the npc.

On 10 Oct ($\lambda=034^\circ\text{Ls}$) Don PARKER (*DPk*) produced a set of images at $\omega=128^\circ\text{W}$. On the morning side at the equatorial area there is a large roundish whitish patch, but it is hard to judge the origin in R, G, and B. The dark fringe of the npc is dark and broad from this angle, and the area to its south seems to show a complex expanse. The southern limb of the image looks blurred.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2013/131010/DPk10Oct13.jpg>

On 12 Oct ($\lambda=035^\circ\text{Ls}$), *Mo* tried to take two sets of images at $\omega=254^\circ\text{W}$ and $\omega=264^\circ\text{W}$. There seems to exist a dusty haunt in Utopia. Hesperia is well cut. Syrtis Mj is definite. The perimeter of the npc is not clear; Maybe this has been caused by the ill presence of his B image: His B looks larger in size, and so it may much contain trembles of the air.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2013/131012/Mo12Oct13.jpg>

Mo's images on 13 Oct ($\lambda=035^\circ\text{Ls}$) are much better at $\omega=245^\circ\text{W}$: In R and L, Nodus Alcyonius looks to be shot. The ætheria dark patch is apparent, and Elysium is visible faintly light in the evening. There is a light stream along the eastern coast of Syrtis Mj. Utopia is not uniform in density. Hesperia is well seen. In R the npc is rather clear, but in RGB the a-bit-larger B image must be an obstruction.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2013/131013/Mo13Oct13.jpg>

Next image set on 16 Oct ($\lambda=037^\circ\text{Ls}$) at $\omega=213^\circ\text{W}$ is also the one produced by *Mo*. In R, Mare Cimmerium is dark. The dark spot at ætheria is definite. Elysium is a bit light, and looks to be connected with Cebrenia. It is possible that both constitute a heart shaped light area with the inside of Elysium being brighter.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2013/131016/Mo16Oct13.jpg>

We welcome Sadegh GHOMIZADEH (*SGh*) from Iran this apparition also: He sent first this apparition to us an observation made on 17 Oct ($\lambda=037^\circ\text{Ls}$, $\delta=4.3''$) at $\omega=290^\circ\text{W}$: Syrtis Mj is seen on the afternoon side, and the description of the npc is moderate.

On 18 Oct ($\lambda=038^\circ\text{Ls}$) at $\omega=196^\circ\text{W}$, *Ak* gave a good set of images: On IR image M Cimmerium is dark, and Cebrenia and Elysium makes a heart-shaped light area: Cebrenia is of a light belt, though less light than Elysium. It is seen also in RGB. In RGB the npc looks thick.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2013/131018/Ak18Oct13.jpg>

On 19 Oct ($\lambda=038^\circ\text{Ls}$) Peter GORCZYNSKI (*PGc*) gave a set of images at $\omega=036^\circ\text{W}$, where M Acida-

lium is near at meridian. Images of R-RGB and IR (742) are shown in addition to R, G, B. The dusty matter which was observed on 1 Oct by *Mo* is still visible at the NE corner of M Acidalium. Aram is caught on the evening side, and the inside of Chryse is complex with shadowy markings. Agathodæmon is seen on the morning side which pushes down Ophir. The southern limb is blurred but not explicit.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2013/131019/PGc19Oct13.jpg>

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On 20 Oct ($\lambda=038^\circ\text{Ls}$), *Mo* observed twice at $\omega=173^\circ\text{W}$ and $\omega=178^\circ\text{W}$. Elysium is now at the morning side. Utopia is near the morning limb followed by a bright limb cloud. Both sets show Propontis I and the preceding dark spots.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2013/131020/Mo20Oct13.jpg>

On 25 Oct ($\lambda=040^\circ\text{Ls}$), *SGh* gave a not-sharp image at $\omega=207^\circ\text{W}$.

On 27 Oct ($\lambda=041^\circ\text{Ls}$, 042°Ls) Jim MELIKA (*JMI*) and *Mo* took images at $\omega=345^\circ\text{W}$ and $\omega=104^\circ\text{W}$ respectively. *JMI*'s is the first contribution this apparition, and shows M Acidalium dark at the morning side, and S Sabæus faintly proceeded. The northern end of Margaritifer S is clearly shown in R. The B image must have been taken with a leakage of a longer wave-length light. *Mo*'s set is rather quiet since the seeing is deteriorated and the angle points to the region without dark markings, but suggests a complex light-and-shade areas at the northern evening region following Tempe.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2013/131027/JMI27Oct13.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2013/131027/Mo27Oct13.jpg>

On 28 Oct ($\lambda=042^\circ\text{Ls}$), 29 Oct ($\lambda=042^\circ\text{Ls}$), 30 Oct ($\lambda=043^\circ\text{Ls}$) and 31 Oct ($\lambda=043^\circ\text{Ls}$), *Mo* successively worked and got the image sets at $\omega=093^\circ\text{W}$, $\omega=084^\circ\text{W}$, $\omega=074^\circ\text{W}$ and $\omega=069^\circ\text{W}$. On 28 Oct the seeing did not improve, while on 29 Oct at $\omega=084^\circ\text{W}$, he obtained a steady set of images: Solis L is quite dark in R, and Nilokeras's northern side is accompanied by a series of light spots in RGB. In LRGB, Candor and its WN also are a bit lighter. The npc turned out to be steady. The southern limb of the images is nicely blurred. On 30 Oct, the LRGB has a defect at the evening terminator, while R image is worth checking. A preceding part of Solis L, near the terminator, shows a light patch. Is it related with Argyre? The WN neighbour of Nilokeras is connected with Candor and makes a lightened belt. Finally on 31 Oct at $\omega=069^\circ\text{W}$, *Mo* obtained a sharp set of images: To the north of Solis L, the Agathodæmon side of Tithonius is dark. In R and L, to the west of Lunæ L a dark spot is definite, though it is not easy to identify it with Ascræus Mons. The dark and shadowy parts of Nilokeras and Lunæ L have become more apparent than before. Good work for the angular diameter of $\delta=4.9''$. To see the successive images of *Mo*, click the following:

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2013/131029/Mo29Oct13.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2013/131030/Mo30Oct13.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2013/131031/Mo31Oct13.jpg>

Meanwhile we will soon come to the season when the inside of the npc will be gradually concerned.

Masatsugu MINAMI & Masami MURAKAMI

Letters to the Editor

●.....Subject: EPSC2013 collaboration pro-am session
Received: 02 Oct 2013 at 15: 12 JST

Dears, On Sept. 12th, 2013 in London I had the honour to chair the European Planetary Science Congress 2013 pro-am collaboration session, prepared with Christophe Pellier (SAF), John Rogers (BAA), Richard Miles (BAA) and professional as

tronomers Leigh Fletcher and Tollis Christou (Many thanks to all). Session went very well, with excellent quality presentations (and posters) which interested very much a good size audience. Please find these presentations along with the abstracts of both oral and poster sessions, and ambiance pictures shot mainly by the well known Greek amateur Manos Kardasis (thanks to him!) :

<http://www.astrosurf.com/delcroix/doc/EPSC2013/EPSC2013.htm>

Rendez-vous next year for another successful session in Portugal I hope!

Marc DELCROIX (Tournefeuille, FRANCE)

<http://astrosurf.com/delcroix/>

●.....*Subject: Re: EPSC2013 collaboration pro-am session*
Received: 02 Oct 2013 at 20:07 JST

Dear Marc (and other conveners), Thanks for the links and pictures of the 2013 EPSC/Am Ast session and other pics - you folks did a great job of organizing and running the splinter workshop, too.

Hope I can make it to Portugal next year.

Padma YANAMANDRA-FISHER

(the Space Science Institute, Boulder, CO)

●.....*Subject: Mo 30 Sept_13*
Received: 2 October 2013 at 22:35 JST

So and so seeing on 30 Sept. The npc ia most apparent.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2013/130930/Mo30Sept13.jpg>

○.....*Subject: Mo 01 Oct_13*
Received: 5 October 2013 at 02:23 JST

Already October came in, while still feeling of summer so that the seeing is preferable. Paid much attention to pint and to my procedure, though not better results.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2013/131001/Mo01Oct13.jpg>

○.....*Subject: Mo 12, 13 Oct_13*
Received: 17 October 2013 at 00: 42 JST

Please accept my images on 12 and 13 Oct. The first day, seeing was very poor, but it a bit improved on 13 Oct. The transparency was very good.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2013/131012/Mo12Oct13.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2013/131013/Mo13Oct13.jpg>

○.....*Subject: Mo 16 Oct_13*
Received: 20 October 2013 at 22: 18 JST

Seeing was poor. Markings appeared when composed. The work of AKUTSU encourages me.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2013/131016/Mo16Oct13.jpg>

○.....*Subject: Mo 20 Oct_13*
Received: 25 October 2013 at 00:12 JST

Visually the npc was most clear, and Propontis I was visible. I shall come to Kanazawa on 26 & 27 Oct, and I want to visit you on the way at Mikuni, but the coming Typhoon seems to prevent me from the stopover at Awara.

I also shot on 21 Oct, but they are terrible.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2013/131020/Mo20Oct13.jpg>

○.....*Subject: Re: How about...? and Mo 27~29 Oct_13*
Received: 4 November 2013 at 16:13 JST

Thank you for your kind enquiries first on 26 Oct and this time. There has been fortunately no damage due to Typhoons at this area.

Incidentally as to my image of the cyclone in 1999, I shall attach here the color image on 27 April 1999 at $\omega=336^\circ\text{W}$ (at 15: 10 GMT).

Otherwise I shall add also some images taken recently on 27, 28, and 29 Oct 2013. I still keep my images on 30 and 31 October.

Yukio MORITA

(Hatsuka-ichi, Hiroshima, JAPAN)

●.....*Subject: Mars 26 September*
Received: 07 Oct 2013 at 11: 49 JST

Hi All, I have attached belated RGB and NIR Mars images from 26 September.

Note the dark streak extending northeast from Crocea, giving the eastern border of Syrtis Major a somewhat different aspect than previous apparitions.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2013/130926/DPk26Sept13.jpg>

Best,

○.....*Subject: Mars 10 October*
Received: 17 Oct 2013 at 11: 46 JST

Hi All, I have attached an RGB Mars image from 10 October. Best.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2013/131010/DPk10Oct13.jpg>

Donald C PARKER (Coral Gables, FL. the USA)

●.....*Subject: Mars images (October 6th.)*
Received: 14 Oct 2013 at 02: 54 JST

Hi all, Here are some Mars images from Oct 6th. The Solis Lacus/Tharsis hemisphere was visible with some clouds visible across the Martian disk.

http://www.damianpeach.com/mars1314/2013_10_06rgb.jpg

Best Wishes

Damian PEACH (Selsey, West Sussex, the UK)

●.....*Subject: Mars, Aug.11th, Sept.23rd, Oct.7th*
Received: 16 Oct 2013 at 04: 09 JST

Hi Mr. Minami, I send some belated images taken earlier and with my most recent session from Oct. 7th,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2013/131007/EMr07Oct13.jpg>

Clear Skies to All!

Efrain MORALES (Peruto Rico)

●.....*Subject: mars.17.oct*
Received: 18 Oct 2013 at 03: 14 JST

This is the first images from 2013 seeing was so so. PLS see you them.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2013/131017/SGh17Oct13.jpg>

Best wishes

○.....*Subject: mars 25 oct*
Received: 26 Oct 2013 at 12: 52 JST

Hi, Here is one capture from Mars. PLS see you it. Condition low. Regards

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2013/131025/SGh25Oct13.jpg>

Sadegh GHOMIZADEH (Roudehen, IRAN)

●.....*Subject: Mars images 2013 Oct. 18*
Received: 19 October 2013 at 22: 17 JST

Attached here a set of Mars images. I tried many times to focus on Mars after the observations of Jupiter, but it seems this year the lower atmosphere has been poorer.

I hear Yukio MORITA changed the telescope to a C14. It is pleasant to know a lot of observers are now using C14.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2013/131018/Ak18Oct13.jpg>

Tomio AKUTSU (Cebu, the PHILIPPINES)

●.....*Subject: Mars image - Oct. 19, 2013*
Received: 21 Oct 2013 at 07: 03 JST

Gentlemen, Attached is a set of Mars images from October 19, 2013. Seeing was no better than average. Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2013/131019/PGc19Oct13.jpg>

Peter GORCZYNSKI (CT, the USA)

●.....*Subject: hi*
Received: 31 October 06: 31 JST

Dear Masatsugu, First I want to apologize for failing to write for so long. Part of the explanation is that I do not type quickly any more, and it has been frustrating to think that there are so many things I would like to say to an old friend, when I can only write them slowly. Also, I have been trying to work as many days as my health and the economy allow. You may remember that my wife, several years younger than I am, has worked for the US government. The inability of our elected officials to agree on a budget has caused her to be furloughed (to not be able to work or be paid for her work). I have been trying to make up for some of the money she has lost due to the budget difficulty. Given my health issues, I have been very tired after working, and I have put off many good things that I might have done.

The spying on our allies that has been done by our government is inexcusable. I have liked Obama, but I do not like the spying.

You will probably remember that I was diagnosed several years ago with Parkinson's Disease. One of the first symptoms that I noticed was that I had a great deal of difficulty writing my nursing notes at the hospital. Back then we used to write the notes by hand into the patients' charts. My writing became very slow, and the harder I tried to write the less legible my writing became. My doctor also noticed that I did not swing my right arm when I walked. After an extensive battery of tests, a neurologist found that I have PD, and I began to take medicines that have mitigated some of the symptoms. While being tested for PD I continued to be

employed by the hospital. Co-workers voluntarily, without being asked, helped me with my notes, often doing all of them. The people who helped me the most were my friends Tyrone Burch and his wife Pamela. Wanda Ferrera helped me a lot too.

Since the automobile accident several years ago, I have had pain in my back, partly due to arthritis, and I have also had arthritis in my knees. All of this has been hard to accept, but I have tried to prioritize and to continue to live a happy and meaningful life.

I no longer work as we say "on the floor" at the hospital. I transport patients for the hospital, mainly military patients, so I am on the road several days a week. Transporting lets me have a bit of income, but I do not have to be on my feet and experience a lot of arthritic pain.

I have read that you have had some PD and that you have some macular degeneration. PD I can understand from personal experience. I am very sorry about your eye trouble. We can hope for medical miracles.

For many years I have wanted to put on paper the poems that have been in my head and my heart. I used the recovery time to do that work. In a very real sense, although the poems were not literally written until recent years, they became real in my mind years or even decades ago. Because I can write at my own pace, I have been able to do the poetry.

Before being diagnosed with PD I did a lot of research on my family tree, and I turned my notes and emails into a book, called Exploring the Cumbia Family Tree. (My mother's maiden name was Cumbia.)

Changing to a more pleasant topic, I want to report that we had German house guests for three weeks last summer. (You probably learned of this elsewhere.) We enjoyed their visit very much. Uta and Tyler want to go to Germany and visit Uta's relatives. They also said, believe it or not, that they would like to see Japan. I have trouble walking, and

I do not feel that seeing the world is for me. If Uta and Tyler can do it, I will be happy for them.

Some time ago, I emailed some pages that I had scanned from an old *Strolling Astronomer*, which were part of a Japanese report published by Haas and ALPO. M Minami was one of the observers listed in the paper. If you want to see the rest of the report, I can scan it for you.

I will not try to prove that ALPO is a great organization that has added a lot to man's knowledge of the universe. I will say that it encouraged me to observe and report my observations, and it encouraged a spirit of healthy self-criticism that was good for me to see in action. ALPO has been a positive part of my life. I have also enjoyed your CMO and have learned a lot from it.

There are some other things I would like to write, but there is no more time. Maybe later....

I hope you will be well.

Samuel WHITBY (VA, the USA)

●.....*Subject: Prospectus of Mars book*
Received: 12 Nov 2013 at 03:34 JST

Dear Masatsugu, University of Arizona Press have been after me to do a new Mars book, to replace my (now very dated) 1996 book "*The Planet Mars*." I am sending for your comments a Prospectus and sample chapter on Percival Lowell.

Hope you are doing well, and look forward to contributing another essay for CMO. One of these days I hope to get around to Pickering for you. Best

Bill SHEEHAN (MN, the USA)

(*Note*) Bill SHEEHAN sent me a prospectus of the forthcoming revised version of his Mars book in addition to a draft of the Chapter for Percival LOWELL. The prospectus is detailed and consists of eight pages where he annotated the contents of Chapters. Here we wish to summarise his plan, though it will never be adequate. **Chap 1** writes about "Early Days" in which the reddish colour of the planet Mars continued to have a great effect on our emotions, half-terrifying and half-fascinating. Here the names of COPERNICUS, Tycho BRAHE, KEPLER, and GALILEI appear. In **Chap. 2** "An Imperial Impetus." In this era of measuring/observing the Solar system, we find the activi-

ties of Giovanni CASSINI and Christiaan HUYGENS in addition of Jean RICHER. **Chap.3:** "Mars above the dreamy spires" where William HERSHEL, SCHRÖTER, BEER, MÄDLER, and John PHILLIPS are picked out together with the now supposed Earth-like planet Mars. **Chap. 4:** "Moons and maps" (A HALL, avid GREEN vs. SCHIAPARELLI). The canali problem, and nomenclature, and colour-blindness. **Chap. 5:** "Fine lines and little gossamer filaments" concerned with LOWELL. **Chap. 6:** "Mars in big refractors" (alternate title: "Whatever happened to the canals of Mars?") Here E E BARNARD at Mt Hamilton appears. Mars gave the impression of being, in his words, "broken by canyon, slope, and ridge" different from LOWELL's "fine lines and little gossamer filaments cobwebbing the Martian disk." FLAMMARION and ANTONIADI make also their appearances. This chapter is said to serve as an "epitaph" to the eye-brain-hand era of planetary observation. **Chap.**

7: "The lingering romance (Studies of Mars from the death of Lowell in 1916 to Mariner 4 in 1965)." **Chap. 8:** "Flybys." (Mariners 4, 6 and 7). SHEEHAN first observed Mars in 1965 when he was 10 years old guided by what-is-his-name like MOORE and others, but the year 1964 was the year of Mariner 4. So 1964 causes something to Bill's classical position concerning Mars. [On the other hand, we (*Nj* and *Mn*) restarted a series of denser visual routine observations from 1969 after knowing the legend-free results of the Mariners.] **Chap. 9:** "New Mars": Volcanoes, Canyons, and Riverbeds (Mariner 9). **Chap. 10:** "New Means." Here the description will be made in a pedestrian way around the times of the advent of the ccd technique. Finally **Chap.11:** "The Martian world"; where a summary seems to be given on Mars' interior, surface, atmosphere, moons, as well as the history of its water including the loss of water. (*Mn*)

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TEN YEARS AGO (223)

----- CMO #282 (10 November 2003),
CMO#283 (25 November 2003) -----

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn0/cmo282/index.htm>
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn2/cmo283/index.htm>

This time also we shall pick out the contents of the two issues of CMO#282 and CMO#283 in November 2003. There have been no printed versions, and so we hope you will refer to the Web versions (URLs above).

In CMO #282, 2003 Great Mars CMO Report (17) treated the observations made at the latter half of October 2003. The Martian season proceeded from $\lambda=280^\circ\text{Ls}$ to $\lambda=290^\circ\text{Ls}$ and the angular diameter went down from $\delta=17.8''$ to $\delta=15.1''$ at the end of October. The tilt φ was from $\varphi=22^\circ\text{S}$ to 24°S , and hence the spc was visible smaller after the summer solstice. The phase angle varied from $\iota=33^\circ$ to 38° , the defect of illumination thus becoming larger at the morning side.

The number of observers decreased from 33 to 25, but a total of 307 observations were sent to us: Domestically, 8 observers produced 226 observations, from the USA 7 observers sent us 40 observations (half of them are from Don PARKER (*DPk*)), from Europe 7 observers sent us 33 observations (among them mostly were performed by Damian PEACH (*DPc*) and Christophe PELLIER (*CPl*)) and from Oceania we heard from 3 observers with 8 observations.

In the Report, firstly MINAMI (*Mn*)'s continuous observations from 16 Oct ($\lambda=281^\circ\text{Ls}$) to 20 Oct ($\lambda=283^\circ\text{Ls}$) are reported, where the aspects of the surface from the morning of Solis L to the evening set of Hellas. The morning mist has been strengthened, and further descriptions were given about the wine-coloured areas, the areas near the spc after the summer solstice, the evening Hellas, the M Acidalium together with the north polar hood and so on. *Mn* (as well as *Mk*) had an impression on 17 Oct ($\lambda=281^\circ\text{Ls}$) at $\omega=357^\circ\text{W}$ that, though the evening side was still yellowish, the northern deserts showed a usual reddish tint. On 19 Oct ($\lambda=282^\circ\text{Ls}$) at $\omega=357^\circ\text{W}$, $\omega=007^\circ\text{W}$ it was

possible to detect the light ruin of Novus Mons, where no explicit snow remained. Furthermore at $\omega=016^\circ\text{W}$, there was witnessed a short projection blown out from the edge of the spc toward Noachis. The spc looked as quite deformed on 19 Oct ($\lambda=282^\circ\text{Ls}$) at $\omega=357^\circ\text{W}$. Next several subsections were given under the following titles "Morning mist at Amazonis" where Canon LAU (*CLa*)'s phenomenon was described, "Morning mist at Hellas" where some reports from the US were cited, "Morning mist at Solis L" which depended on the Japanese observations, and then follow further subsections entitled "Wine-coloured areas", "Surroundings of the spc", and "Division of the spc" where it was stated that *DPk*'s images on 16 Oct ($\lambda=280^\circ\text{Ls}$) at $\omega=264^\circ\text{W} \sim 278^\circ\text{W}$ prove a division of the spc, and also alluded to the observations of E E BARNARD in 1894, and finally "Mare Serpentis" where it was shown that the darkened area of M Serpentis in July is compared with the work by *Mo* on 25 Oct at $\omega=328^\circ\text{W}$. In Miscellany at the end it was reported that S KOWOLLIK (*SKw*) closed her routine work at the end of this period. She sent us a total of 172 images during the apparition. Also noted that *Mo*'s machine recovered, and some notes were given about T KUMAMORI (*Km*), *Mk* and those at Fukui.

The LtE in CMO#282 contains those emails received during the period: 25 October ~9 November 2003. From abroad, Ed GRAFTON (TX, the USA), Silvia KOWOLLIK (Germany), Eric NG (吳偉堅, Hon Kong), Don PARKER (FL, the USA), Damian PEACH (the UK), Christophe PELLIER (France), Bill SHEEHAN (MN, the USA), Elisabeth SIEGEL (Denmark), Maurice VALIMBERTI (Australia), John WARELL (LPL, AZ, the USA) sent to us, and domestically we received from T AKUTSU (Tochigi), T ASADA (Fukuoka), K HORIKAWA (Yokohama), S ITOH (Tokyo), T IWASAKI (KitaKyushu), KUMAMORI (Sakai, Osaka), I MIYAZAKI (Okinawa), Y MORITA (Hiroshima), K OSA (Ishikawa), Miyuki UMEDA (Fukui City Museum of Natural History).

Next in CMO #283, the observations in the first half of November were dealt with as 2003 Great Mars CMO Report (18). The Martian season proceeded from $\lambda=290^\circ\text{Ls}$ (1 November) to $\lambda=299^\circ\text{Ls}$ (15 November) and the angular diameter δ decreased from $\delta=15.0''$ to $\delta=12.9''$. The tilt φ read from 24°S to 25°S . The phase angle ι increased from 38° to 41° .

The number of observers went down to 23 with 202 observations. In Japan, 9 members contributed 154 observations, while from the US we heard from 6 observers with 22 observations, from Europe we did from 6 observers with 16 observations, and from Oceania 2 persons sent us 10 observations.

In Report (18) there are reported several items with subsections, while it seems that the highlight of this period must be "Auroral protrusion phenomenon from Ausonia-Hellas" first chased by *Mn*. On 4 November 2003 ($\lambda=292^\circ\text{Ls}$) at $\omega=203^\circ\text{W}$ *Mn* found it visually, and on 7 November he detected it again at the same LCM: $\omega=203^\circ\text{W}$. On 8 November, Isao MIYAZAKI (*My*) who had received an alert from *Mn* by a modem succeeded in certificating the existence of the protrusion through ccd images. Later we heard some images taken by Y MORITA (*Mo*) proved to show the phenomenon on 6

November. It was supposed this phenomenon must have been caused by a large X-type flare or CME (Coronal Mass Ejection) and hence the report picked out the Solar data. The fact that similar phenomena were also detected at the same Martian place in the US and Europe in 2012 is fresh in our memory. Otherwise the Report (18) included several statements under the subtitles: "Morning mist", "LAU phenomenon", "Wine-coloured dark areas", "Description of the evening limb", "Arsia Mons", "The spc and its surroundings", and "the nph". Every item was detailed.

The LtE in CMO#283 were those received from 10 November to 24 November 2003. From abroad we received from Roland CHAVEZ (GA, the USA), Konrad DENNERL (Germany), Mario FRASSATI (Italy), Ed GRAFTON, Silvia KOWOLLIK, Richard McKIM (Peterborough, the UK), Don PARKER, Christophe PELLIER, Bill SHEEHAN, Richard SCHMUDE (GA, the USA), Clay SHERROD (AR, the USA), Randy TATUM (VA, the USA), Maurice VALIMBERTI, †Erwin Van der VELDEN (Australia), and Johan WARELL. Domestically we heard from AKUTSU, ASADA, Atsushi HIRAOKA (Tokyo), IWASAKI, KUMAMORI, MIYAZAKI, OSA, MORITA. HIRAOKA's was concerned with the Lowell Conference to be held in 2004 at the Noto Peninsula.

Ten Years Ago (099) corner was about CMO #139 (25 November 1993) which was written in English by *Mn*.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn0/283tya99.htm>

The first several pages of CMO #139 were for an introduction to Richard McKIM (*RMk*)'s articles on E M ANTONIADI in the BAA Journals (*JBAA* 103 (1993) 164-170 (Part I) and *ibid* 219-227 (Part II)). Next was about what CMO 1992/93 Note (12) wrote: Here is shown "a tendency of the recession of the npc in 1992/93 based on MINAMI's 450 observations (made twenty years ago) from $\lambda=348^\circ\text{Ls}$ ($\delta=10.1''$) to 058°W ($\delta=8.1''$). Measurements were made by *Mn*, and NISHITA (*Ns*) plotted". The spiral diagram cited was of the period from $\lambda=017^\circ\text{Ls}$ to $\lambda=029^\circ\text{Ls}$.

Masami MURAKAMI (Mk) & Masatsugu MINAMI (Mn)

International Society of the Mars Observers (ISMO)

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

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

CMO #416/ ISMO #42 (25 November 2013)

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



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