

MARS

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OBSERVATIONS

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Miracles occurred on 18 October 2005

奇蹟的だった十月18日 GMT

■ 南 政 次 M MINAMI

I. Introduction

Half a century has passed ever since we had the view that the yellow cloud should play a significant rôle with respect to the Martian meteorology, while it seems no body has ever succeeded in explaining definitively what on earth is responsible for the disturbance of the dust (what kind of mechanism), even when on earth it is first entrained (at noon or at dawn?) and how on earth it subsides or develops (on the day or on the next day). One of the reasons why we have been incapable is that we have lacked any definitive series of observations hitherto to generate a plausible view or theory. There may be put a lot of virtual views on dusts, but we should say there might have been few observations to tell the good from the poor ones. It is apparently useless even if any observer is voluntarily content to be in search of the bright spots by the use of the Red filter: Such a kind of observations must have lasted long, but have never been exposed to any astringent criticism.

First of all, there are known a lot of observations of dust or yellow clouds, but we know few were chased hourly, and especially we have scarcely met the case of the morning state of the dust just entrained. Have anyone witnessed the instant any dust has just born on Mars? Even in 1956, the Noachis great dust storm, which first made us open our eyes to this problem, was only observed in the Martian afternoon. The bar-like dust trail

was observed in Japan (when the present writer (*Mn*) was only 17 years old, as well as Don PARKER), while its preceding region on the vacant Pacific Ocean was too large to produce the preceding observations at the morning side of the Martian day. At that time, there was established an International Mars Committee by the Lowell Observatory to collaborate world-widely, and the OAA (led by the late Dr Issei YAMAMOTO) organised a National Mars Committee, but *Mn* remembers nothing (or just heard that one of the staff of the Fukui City Observatory joined at an NMC meeting at Atami, or otherwise heard that a set of not-yet-exposed plates reached Kobe from Lowell Observatory, but never heard they were used. Independently, Sadao MURAYAMA produced a set of photos of the Noachis dust which was emergent on 20 August 1956, and because of this contribution he was awarded *Prix Henri REY* from the SAF in 1971-much earlier Shiro EBISAWA was did *Prix Georges BIDAULT de l'ISLE* in 1958 due to his remarkable contribution concerning the 1956 Noachis dust. Both used an excellent 20 cm refractor in Tokyo).

One cycle later in 1969, the *International Planetary Patrol* (IPP) programme was established under the auspices of the Lowell Observatory and others. As to this, we can refer to W A BAUM's short résumé "*The International Planetary Patrol Program: An Assessment of the First Three Years*", *Planet. Space Sci.* **21** (1973) 1511. The network was spanned by the observatories at Mauna Kea, Flagstaff, Cerro Tololo (Northern Chile), Johannesburg, Kavalur (southern India), Perth (western Australia) and at Mt Stromlo (eastern Australia). Some may remember a snapshot of Don PARKER at the control of

the 61cm Cass at the Cerro Tololo Inter-American Observatory. In the first year, the New Mexico State University joined, but defected, and Mt Stromlo Observatory also had retired from this programme when BAUM wrote this résumé. Then the distance from Australia to Hawaii must have become farther by more than 5 hours. It also looks strange that no station was found around the Canarias, and hence the distance was also far from Johannesburg to Cerro Tololo (about five hours). However especially in 1969, 1971 and 1973 sufficient and excellent results were delivered (partially cited below). We can refer to several good images in 1971 produced at these stations, for example, in *S&T* November 1971 issue (p262). Due to a changeover of the policy of the Lowell Observatory, however, this programme was stuck in 1976.

As is seen in the following phrases of BAUM "*The purpose of the program is to obtain uninterrupted imaging so that we can investigate the day-to-day and hour-to-hour changes in the large-scale atmospheric and surface features of the planets*", the programme was aimed not only at the day-to-day observations, but also at the hour-to-hour ones. The above résumé shows enough excellent examples of the day-to-day observations, but few about the hour-to-hour results: Just it suggests that to measure the zigzagged boundary of the polar cap, it will need to fix the depth of the cap every ten degrees (Fig 4). However we suspect the famous regression curves of the spc made by G E FISCHBACHER, L J MATIN and W A BAUM in 1969 (cited there as a reference) were obtained based on the Lowell data bank ranging over 60 years by reading a number of selected meridians from different apparitions (from $\lambda=150^\circ\text{Ls}$ to 270°Ls every ten degrees). Just BAUM assures that while the number of the planetary (not only Mars) image sequences secured at Lowell Observatory from 1903 to 1968 was no more than 10,086, IPP's sequences from 1969 ~ 1971 amounted to 56,000 (maybe every sequence is composed of 14 images). [According to Eeal C SLIPHER, the total number of Mars images at Flagstaff from 1903 to 1960 was recorded 126,000.]

Recently the ccd amateur imagers augmented the number and quality, and compatible Mars images are se-

cured densely in the American continents, in the Oceania-Oriental areas, and in Europe. Just there are still two big gaps; one at the long span of the Pacific Ocean and the other at the area between Asia and Europe.

We know that one reason the IPP programme was suspended was because the Martian orbiters or landers or vehicles began to be launched to be operated at Mars. It should however be remarked here that the MGS is quite impotent in detecting the hour-to-hour changes on Mars: For instance it has a less powerful point than the IPP in the sense it was not planned to look down at the morning terminator.

II. Hour-to-Hour Observations

The reason why we need a world-widely spread Mars observable stations (as planned by the IPP programme) is because both of Mars and the Earth rotate quite similarly: Just his is a bit longer than the rotation period of the Earth by about 40 minutes (since we should also take account of the relative velocity). The time span of 40 minutes just implies about 10° in angle. That is, we shall need 36 days (or 40 days since it is not exactly 10°W , but less) to look through the whole surface. If we can observe it for four hours a night, it just rotates by 60° (4 hrs), and so in order to chase the surface of the red planet through the day we need six stations separated by 60° sequentially on the Earth.

Conversely it implies that we can observe the same surface as the day before if we start late by 40 minutes on the following day. That is if we delay the unique observation time every night by 40 minutes, we can observe the same surface (or same $\omega=\text{LCM}$) every night. If we can delay successively a total of four hours, we are able to observe the same surface consecutively for six days, and compare the six surfaces with the same ω . This is a true day-to-day observation. At the days when Mars is near at opposition, we can observe for at least seven hours (if endowed with a clear sky), then we can chase the same surface for about ten days to compare.

We further note that since there is no definite surface to be observed in general, any time is valuable, and it is annoying to delay the first observation time by 40 minutes every night. Hence if we repeat the observations every night at the consecutive times different by 40 min-

utes (that is, if we shall start every night at the same time, and observe every 40 minutes), there will be secured a lot of observations to be compared day-by-day, each being different by 10°W . Remark however that the span of 40 minutes is not exact, and really during the time of 40 minutes the planet appears to rotate by no more than 9.8° (different every day; differs largely before and after the perihelion), we need to revise once or twice in a while: If we repeat 40 minutes several times the ω decreases easily by 1°W .

To sum up, the routine day-to-day observations must be more valuable if we observe six to ten times every 40 minutes (40 minutes-to-40 minutes) at the fixed times. In the case of the ccd observations, it may be possible to shoot every *twenty* minutes. Then there will be produced two sets of sequences. At the Fukui City Observatory, we (NAKAJIMA=*Nj* and *Mn*) usually observe alternately each for 20 minutes, and so we have two sets of 40 minute observation sequences.

As an example of the result of day-to-day images of the same ω , see Yukio MORITA's images who chased the same surface from 1 July to 4 July 2001, showing clearly a developing of the global 2001 dust:

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn2/Mo1-4July01.htm>

See also another old 1990 example that incorporates also the hour-to-hour changes; once recorded in CMO #096 p0816, and uploaded in:

http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn2/1990oct_nph.gif

More recently, the July 2003 dust was recorded in this way:

http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn3/Mn_July03Cloud.jpg

Unfortunately, the last example does not show the dust at the morning side though we started as early as possible.

In the present Note, we deal with only the case of 18 Oct 2005, and henceforth we refrain from alluding to the day-to-day variations.

III. Observations Every 40 Minutes on 18 October 2005

Now we are in a position to treat the miraculous case of 17 Oct~18 Oct 2005 ($\lambda=308^\circ\text{Ls}$). We should say it is a rare and long longed-for case to be able to chase any dust from morning to evening. The observations which were reported to the CMO amounted to a total of about

40 in number if we count from Richard McKIM (*RMk*)'s drawing made on 17 Oct GMT at $\omega=304^\circ\text{W}$. Fortunately a new significant dust was first observed in Europe from the early morning, and after safely crossing the Atlantic Ocean, it was caught at the east coast of the US, and ended (that is, the cloud went out to the night side) at the west coast of the US continent.

It is our honour to record that the first person who performed a distinguished contribution to us is Silvia KOWOLLIK (*SKw*), Ludwigsburg, Germany (<http://www.silvia-kowollik.de/>). She used a 15 cm Newtonian equipped with a ToUcam. As we shall repeat in the Appendix, she must have been the first observer that was really aware of the renewed dust burst, and readily communicated about it to CMO on 18 Oct at 1:55 GMT by email. It was received by MURAKAMI (*Mk*, at Fujisawa, Japan) and MINAMI (*Mn*, at Mt Hamilton, CA, USA), and soon we were on the alert (but *Mn* needed to wait for a few hrs to catch the planet). *SKw* sent her second email to us at 3:47 GMT, and *Mn* sent emails to *Mk* (to prepare to send out an Alert to the CMO members) and *SKw* (to confirm and to chase further) around 4:17 ~ 4:20 GMT. It was very fortunate that she was a member of our CMO and she knew the CMO method of the Mars observations. She obtained a total of eleven precious images every 20 minutes from 01:45 GMT to 05:04 GMT as follows:

SKw 01:45 GMT $\omega=353^\circ\text{W}$
SKw 02:04 GMT $\omega=358^\circ\text{W}$
SKw 02:24 GMT $\omega=002^\circ\text{W}$
SKw 02:44 GMT $\omega=007^\circ\text{W}$
SKw 03:04 GMT $\omega=012^\circ\text{W}$
SKw 03:24 GMT $\omega=017^\circ\text{W}$
SKw 03:44 GMT $\omega=022^\circ\text{W}$
SKw 04:04 GMT $\omega=027^\circ\text{W}$
SKw 04:24 GMT $\omega=032^\circ\text{W}$
SKw 04:44 GMT $\omega=037^\circ\text{W}$
SKw 05:04 GMT $\omega=041^\circ\text{W}$

From the east coast of the USA, Sean WALKER (*SWk*) took an image at $\omega=012^\circ\text{W}$ (at the same time as the fifth observation of *SKw*). This was made at 3:04 GMT, and so from around the time it must have been possible to see the planet in the eastern sky from the A-

merican continents. So we shall say the Atlantic Ocean was not any obstruction. Also at the same time with the ninth observation of *SKw*, Don PARKER (*DPk*) produced an R image of $\omega=032^\circ\text{W}$ at 4:24 GMT (also G and B near the time, and so the colour composite). Otherwise Bill DICKINSON (*WDc*) at VA took at 04:20 GMT ($\omega=031^\circ\text{W}$), Martin GASKELL (*MGs*) at NE at 04:41GMT ($\omega=036^\circ\text{W}$).

The second person (and the first person in the US) that played a great role was Joel WARREN (*JWn*), Amarillo, TX. He first produced a set of image at 3:23 GMT ($\omega=017^\circ\text{W}$) which corresponded to the 6th observation of *SKw*, and soon became aware of the presence of the dust disturbance, and sent out an alert to his mail list on 04:20 GMT: In the list, about 40 members of CMO were included. His observations, by the use of a 20cm SCT, were eventually made as follows:

JWn 03:23 GMT $\omega=017^\circ\text{W}$

JWn 04:40 GMT $\omega=036^\circ\text{W}$

JWn 06:50 GMT $\omega=067^\circ\text{W}$

The present writer (*Mn*) sent an email of confirmation to *JWn* as well as those on his list at 4:58 GMT and informed them of *SKw*'s earlier observation (see Appendix). *JWn*'s 4:40 GMT image arrived at 05:12GMT, but at that time *Mn* moved to the 91cm big dome and began to observe. Later *Mn* found *JWn*'s email in which he hoped to shoot at 06:00GMT, 07:00GMT, and so he was indifferent to the implications of 40 minutes.

The third great contributor was Dr Clay SHERROD (*CSr*), Arkansas Sky Observatory, AR, and gave images as follows:

CSr 05:01 GMT $\omega=041^\circ\text{W}$

CSr 05:40 GMT $\omega=050^\circ\text{W}$

CSr 06:22 GMT $\omega=060^\circ\text{W}$

CSr 07:02 GMT $\omega=070^\circ\text{W}$

Miraculously, Dr *CSr* in the middle of the US caught Mars just when *SKw* in Germany saw off the planet low in the west, and *CSr* claims his clock exactly ticked out every 40 minutes (unfortunately however the image at $\omega=041^\circ\text{W}$ is slightly ill-timed). During the angles $\omega=050^\circ\text{W}\sim\omega=070^\circ\text{W}$, *WDc* took an R image at $\omega=051^\circ\text{W}$, Frank MELILLO (*FMI*) at $\omega=052^\circ\text{W}$, Ed GRAFTON (*EGf*) at $\omega=065^\circ\text{W}$, Bill FLANAGAN (*WFl*)

at $\omega=066^\circ\text{W}$, 072°W (both at Houston), and Jim PHILLIPS (*JPh*) (at Charleston, SC) at $\omega=070^\circ\text{W}$ produced good images.

The present writer (*Mn*) was fortunately staying at the Lick Observatory, Mt Hamilton at 1,284 metre above sea level near San José, CA, and just after *SKw* was forced to stop, he could start to observe by the use of the grand refractor: Yes, the dust was very apparent, and looked to show a whitish-yellow tinge and roundish. The first observation succeeded the last of *SKw*'s $\omega=037^\circ\text{W}$ as follows:

Mn 05:30 GMT $\omega=048^\circ\text{W}$

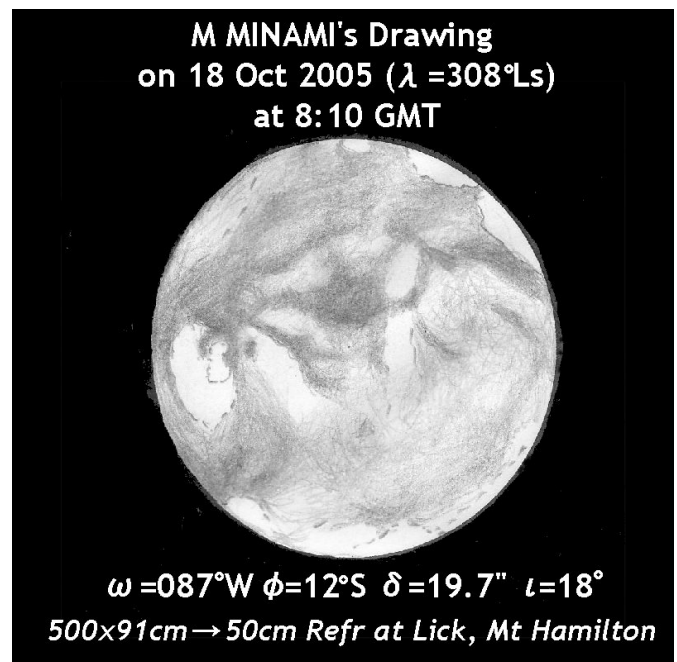
Mn 06:10 GMT $\omega=057^\circ\text{W}$

Mn 06:50 GMT $\omega=067^\circ\text{W}$

Mn 07:30 GMT $\omega=077^\circ\text{W}$

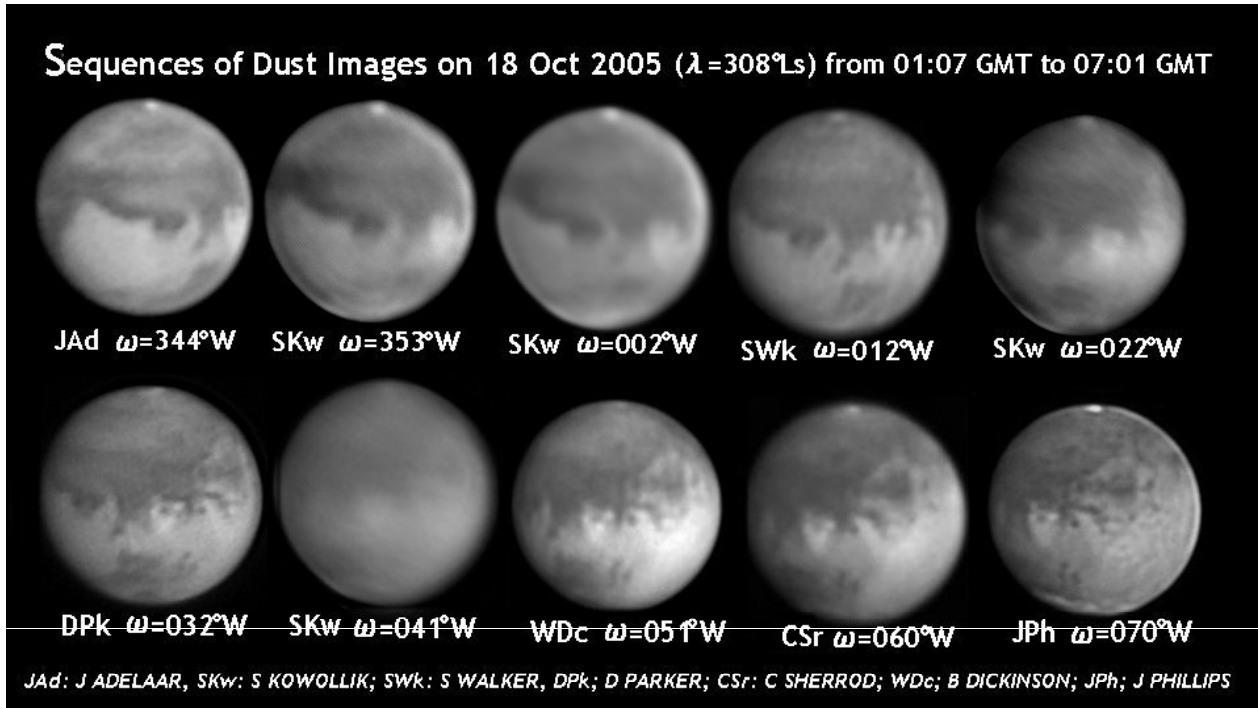
Mn 08:10 GMT $\omega=087^\circ\text{W}$

Mn 08:50 GMT $\omega=096^\circ\text{W}$



After *Mn*'s last observations, Laurie HATCH (*LHt*) produced a colour drawing of the dust which was near the terminator. She spent about one hour in colour completion up until around 10 hrs GMT, and hence we suppose her observation time was at 09:30GMT or at $\omega=106^\circ\text{W}$.

Before sorting out, we should refer to the observations made earlier than the start time of *SKw*. After *RMk*'s drawing, Johan WARELL (*JWr*), Sweden, took images at $\omega=309^\circ\text{W}$, Damian PEACH (*DPc*), UK at $\omega=323^\circ\text{W}$ & 6°W , Dave TYLER (*DTy*) (from this 18 Oct GMT) at ω



= 329°W , David ARDITTI (*DAr*) at $\omega=336^{\circ}\text{W}$, and finally Jan ADELAAR (*JAd*) at $\omega=344^{\circ}\text{W}$. The images after *DAr* explicitly show definitely the morning dust and they are very precious.

Thus we can say we obtained two sets of the observations made every 10°W . The first one is listed in Table I:

Table I

<i>JAd</i>	01:07 GMT	$\omega=344^{\circ}\text{W}$	
<i>SKw</i>	01:45 GMT	$\omega=353^{\circ}\text{W}$	
<i>SKw</i>	02:24 GMT	$\omega=002^{\circ}\text{W}$	
<i>SWk</i>	03:02 GMT	$\omega=012^{\circ}\text{W}$	or <i>SKw</i>
<i>SKw</i>	03:44 GMT	$\omega=022^{\circ}\text{W}$	
<i>DPk</i>	04:25 GMT	$\omega=032^{\circ}\text{W}$	or <i>SKw</i> or <i>WDC</i>
<i>Skw</i>	05:04 GMT	$\omega=041^{\circ}\text{W}$	or <i>CSr</i>
<i>WDC</i>	05:43 GMT	$\omega=051^{\circ}\text{W}$	or <i>CSr</i> or <i>FMI</i>
<i>CSr</i>	06:22 GMT	$\omega=060^{\circ}\text{W}$	
<i>JPh</i>	07:01 GMT	$\omega=070^{\circ}\text{W}$	or <i>CSr</i> or <i>WFl</i>

Here we show this series of ten images in a file. (Please don't confuse *SWk* with *SKw* as we do frequently.)

On the other hand, from the other branch of *SKw*'s work, we can make another series in Table II. In the latter, we miss any lack of the $\omega=347^{\circ}\text{W}$ images, while the pursuit ranged nearly ten hours, and the angles were covered about 150°W : Taking into account a disadvantageous condition $\iota=18^{\circ}$, we should say the present sequences may belong to the best ones ever obtained.

Table II

<i>DPc</i>	23:56 GMT	$\omega=326^{\circ}\text{W}$	
<i>DAr</i>	00:36 GMT	$\omega=336^{\circ}\text{W}$	
		$\omega=347^{\circ}\text{W}$	missing
<i>SKw</i>	02:04 GMT	$\omega=358^{\circ}\text{W}$	
<i>SKw</i>	02:44 GMT	$\omega=007^{\circ}\text{W}$	
<i>JWn</i>	03:23 GMT	$\omega=017^{\circ}\text{W}$	or <i>SKw</i>
<i>SKw</i>	04:04 GMT	$\omega=027^{\circ}\text{W}$	
<i>SKw</i>	04:44 GMT	$\omega=037^{\circ}\text{W}$	or <i>JWn</i> or MGs
<i>Mn</i>	05:30 GMT	$\omega=048^{\circ}\text{W}$	
<i>Mn</i>	06:10 GMT	$\omega=057^{\circ}\text{W}$	
<i>JWn</i>	06:50 GMT	$\omega=067^{\circ}\text{W}$	or <i>Mn</i> , <i>WFl</i> , <i>EGf</i>
<i>Mn</i>	07:30 GMT	$\omega=077^{\circ}\text{W}$	
<i>Mn</i>	08:10 GMT	$\omega=087^{\circ}\text{W}$	
<i>Mn</i>	08:50 GMT	$\omega=096^{\circ}\text{W}$	
<i>LHt</i>	09:30 GMT	$\omega=106^{\circ}\text{W}$	

IV. On the IPP Work

There may be several reasons why the hour-to-hour observations are still necessary and important: One is that there are few observations that have traced out how the dust burst spends in the morning, at noon and in the evening except for the 1971 data secured by the IPP. Furthermore, some interpretations of the IPP results are controversial, and so there still remain a few of disputatious discussions. The following were once picked out in an earlier CMO (#256 (25 Jan 2002) p3233) or in:

<http://www.kwasan.kvoto-u.ac.jp/~cmo/cmomn0/01Note02/index.htm>

but here we will paraphrase again its details to some extent.

In the article of S EBISAWA and A DOLLFUS entitled "*Martian Dust Storm at the Early Stage of Their Evolution*" *Icarus* **66** (1986) 75, they, based on their observations of several big dust storms ever checked visually by them, especially on the 1971a dust experience, stated an objection to some statements made in C F CAPEN's "*A Martian Yellow Cloud-- July 1971*" *Icarus* **22** (1974) 345. CAPEN's is a laborious and fruitful work based on the IPP photographs in July, and figured out the trend of the 1971a during the first twelve days from 10 July. As to the first day sequence, he prepared two charts of the dust expansion, one in AM and the other in PM. Concerning this first day, EBISAWA and DOLLFUS summarised as "*Capen stated that the cloud was first seen as an irregularity on the morning limb, but as it rotated onto the visible disk it expanded east-west and had the same appearance and location as the initial clouds of the dust storms observed in August 1956, May 1969, and September 1971. He went on to describe the storms' changes and expansions that took place hourly through out the day.*" The last phrase is a summary of the following of CAPEN's: "*Weak obscuration appeared in western Hellas and at the east end of Sabaeus Sinus about noon. By mid-afternoon these active areas had brightened and coalesced to form an elongated cloud with a north-east major axis and a short, west component.*"

On the contrary EBISAWA and DOLLFUS criticise as: "*Conversely, our visual observations of the same night (10-11 July) indicated that the yellow component of this cloud did not appear to expand but maintained nearly the same sharp boundary throughout the Martian day. We also observed an obscuration over Hellas which was yellowish white and in contrast with the principal bar-like pure yellow cloud. Subtle color differences are easier to identify visually, enabling us to readily distinguish between yellow dust veils and adjoining white clouds, even when several clouds of different natures are intermixed or near the limb.*"

In the PM region, CAPEN used four IPP photos taken

every one hour.

In fact we can see the descriptions of CAPEN about the contours of the dust cores are different from the description of the emergent dust on EBISAWA's drawings. EBISAWA is of the opinion that the emulsions cannot reproduce precisely the shape and density because of the coarse grains and contrast sensibility. In Fig 6 of their article, he tried to show an inspected drawing of the entrained Noachis dust on 20 Aug 1956 made from MURAYAMA's photo and compared with his own visual drawing at the eyepiece on the same night (by the same refractor). In appearance, the shape or contour of the dust core looks very different: On the photo film the core is brighter near the CM and looks fat there. EBISAWA and DOLLFUS seem to believe that the photo might not reproduce the going away dust which still remains constant in brightness and outline as it is near the evening terminator. This paper was refereed by R W ZUREK and L J MARTIN (once revised and then accepted).

Information obtained through the trace transcription of dusts on the photos sometimes gives a queer impression since the dust looks as if it is always brighter at the area from the CM to noon line. Leonard MARTIN is known to have given an exquisite survey of the 1971b and 1973 dusts, and one of famous produce is a panel in which the outlines of dusts were depicted at two-hour intervals on the 11th day (on 3 Oct 1971 and 23 Oct 1973 respectively): These are shown in Fig 6 in L MARTIN "*1973 Dust Storm on Mars: Map from Hourly Photographs*" *Icarus* **29** (1976) 363. These show as if the cores move from Solis L to M Erythraeum, and then to Noachis, and finally to Hellas during a period of 12 hrs. On the 11th day, the dust may show a diffused aspect with spotted dust cores, while such an outline trace of the brighter parts looks imaginary and gives a misunderstanding. In another résumé by W A BAUM ("*Results of Current Mars Studies at the IAU Planetary Research Center*", in *Exploration of the Planetary System* pp241-251 (edit. Woszezyk and Iwaniszewska, 1974), he there cited MARTIN's virtual chart of the 11th day sequences of 1971b, and wrote as follows: "*We find, in fact, that the dust storm seems to be locally regenerated in this manner about midday each day during its developing stages.*"

This looks quite imaginary, and to our experiences this is not the case. Unfortunately however, EBISAWA and DOLLFUS did not refer to this reference.

EBISAWA states that the boundary outline of the 1956 Noachis dust as well as that of the 1971a emergent dust should be said quite clear, and stable, and sank as it was from the terminator. However in the Noachis cases of EBISAWA's, the observations were limited only to the afternoon side. This was also the case when we chased the July 2003 dust at Okinawa, though the 4 July emergent bright dust showed a zigzagged contour, and looked curved. However the shape remained stable and went out without any deformation as stated by EBISAWA and DOLLFUS.

This time, however, we secured a rather complete covering data from morning to evening. This is the place to emphasise that the sequential or hourly observations are essential and important, and we shall postpone the detailed analysis of the diurnal dust variations on another occasion, but roughly speaking we should say the emergent dust on 18 Oct 2005 does not suggest any macroscopic change including the outline from the early morning to the late evening up to the terminator. We can suggest at least that any regeneration in the midday was not proved.

V. How About at Dawn or in the Early Morning?

The observations of 18 Oct dust may give a data to answer another important question since the dust was caught early in the Martian morning. The reason why we need many data of dust at the morning side is this: If no dust was observed on the preceding day at the very place, and if the newly built dust looks stable diurnally at the Martian day time, we should suspect the dawn line or the early morning terminator as the critical area where the first disturbance must occur since at night the troposphere must have been inactive. We suppose hitherto a generation or regeneration of dust around midday was long believed because the insolation must be physically strong around the noon, and the morning side was paid less attention.

In this sense, among the observations this time, *DTy*'s images at $\omega=329^\circ\text{W}$, *DAr*'s at $\omega=336^\circ\text{W}$, *JAd*'s at $\omega=344^\circ\text{W}$, and *SKw*'s $\omega=353^\circ\text{W}$ are precious. *DAr*'s R

image shows a detail of the dust already, *JAd*'s image clearly shows the dust in the same form as seen later.

Unfortunately, however, the phase angle was $\tau=18^\circ$, so that it was impossible to watch the first one hour in the morning. In the case of *DTy*, the limb edge was at $\Omega=041^\circ\text{W}$, and as was evident later, the eastern edge of the dust was nearly at the angle, and so the image was critical.

Another important result that the present series of observations imply is that they proved the existence of the water vapour associated with the dust disturbance. This is already shown on *DTy*'s B image, and also clear on *DAr*'s G and B images cited above. This water vapour survived through the noon and is clearly shot in B of the excellent images of *WFl* at $\omega=066^\circ\text{W}$, 072°W and others.

The observations of the morning state of the just-generated dust storm are few, while the IPP programme was effective in this respect, and there are known some about the 1971a and 1971b. In the case of the 1971a dust, however, the phase angle was so large as $\tau=25^\circ$ that the case was poorer than the present case. In CAPEN's article above cited, the R image taken on 10 July 1971 at 19:26 GMT is shown (taken at Perth, earlier than at Meudon of EBISAWA's by 5 hrs). Since $\omega=247^\circ\text{W}$, the limb was near at $\Omega=312^\circ\text{W}$, and hence M Serpentis must have been inside the disk, but not so clear on the photo (the reprint *Mn* keeps is original sent from CAPEN or Lowell Observatory, not any zerox copy). The B image seems not available, and the UV image at 21:59 GMT ($\omega=284^\circ\text{W}$) does not show the cloud.

As to the 1971a emergence, W A BAUM impressively reported as follows (in the second résumé): "*In September 1971, ..., there was no visible evidence of any unusual activity on September 21st, but early the following morning as Noachis emerged from the morning terminator, it was brighter and whiter than any features of the storm during the days that followed.*" At that time Mars was after opposition (already on 10 Aug), and τ was already as large as 30° , and so very preferable since the morning terminator was quite inside. It must have been based on the work at the Republic Observatory (formerly Union Observatory). It is important to pay attention to the word "*whiter*", and so the B image worked well.

That the condensate plays a decisive rôle at the moment of the onset of the dust disturbance was pointed out by the late Prof Shotaro MIYAMOTO in the case of the 1956 Noachis dust. His observation was made at $\omega=333^{\circ}\text{W}\sim 338^{\circ}\text{W}$ on 20 Aug 1956, and so it was also at the afternoon side, but he clearly stated "*The cloud on the night of 20 August was white in color and its brightness was next to the south polar cap,*" and in another Chapter, stated that it "*may be called the "yellow cloud" because of its white-yellowish tint. But the present cloud, at least, may possibly contain some amount of water vapour.*" (*Contri. Inst. Astrophys. and Kwasan Obs. Kyoto Univ.* No.71 (1957)).

In this sense, the situation of the present observations on 18 Oct 2005 should be said to provide a pertinent example in detecting the condensate associated with the emerged dust (almost through the Martian day). *DPC* took images at $\omega=328^{\circ}\text{W}$, 333°W before midnight GMT, whose B shows well a thick condensate coming. He also took one day before on the early morning of 17 Oct GMT at $\omega=340^{\circ}\text{W}$ in B of which the water vapour looks weaker, though the angle was not put in order.

VI. Retrospective to Prospective

The IPP programme, as aforementioned, was put in orbit in 1969, and successful in 1969, 1971, and 1973 (based on the IPP 1969 data, the *nph* in B was studied by L MARTIN and W McKINNEY in *Icarus* **23** (1974) 380. See also L MARTIN; *Icarus* **26** (1975) 341 for another *nph* study), but in 1974 the stations were reduced to only *three*, and at last in 1976, the programme was exploded in the midair. That meant that the era of probes arrived. The tradition of the Lowell Observatory which had long been a Mecca of Mars came to an end. The Lowell Observatory employed long several excellent Mars observers like E C SLIPHER, C F CAPEN, and L J MARTIN, but after the death of Leonard MARTIN in April 1997 at the age of 67, it ceased from employing any other Mars expert (W A BAUM lost his interest in Mars around 1984, and left the Planetary Research Center, Lowell Observatory at the beginning of the 1990's). The Observatory must have thought that Mars was no longer the object of interest of the astronomers, and was sold to the geologists. Otherwise we may bor-

row the following ironical saying of Bill SHEEHAN, "*There was no more reason for the observatory to hire a Mars expert than to hire an expert on the Grand Canyon!*" (*private communication*).

L MARTIN is less known to us (in Japan) than C CAPEN, but he must also have been a good mentor to young American Mars freaks. Bill SHEEHAN remembers that MARTIN's book review in *S&T* of SHEEHAN's "*The Planet Mars*" (Univ of Arizona Press 1996) must have been the last manuscript MARTIN wrote for himself, though as one of co-authors, he published the article "*HST Observations of Early Spring Dust Storms in the North Polar Region of Mars*" (*Bull AAS* **29** (1997) 961) in July 1997 after death.

This really implied the end of Mars Hill, but does never imply the end of the terrestrial observations of Mars. The probe era is never complete. For example, why on earth the HST missed the chance of taking pictures of the entraining of the great 2001 dust at the early stage? And why on earth no IAUC notice was there? The MGS is providing a lot of 2h PM data, and at the same time to the professionals a lot of work of detailed analyses, but we are sure they will never be complete.

In this sense, though we are not well organised yet as the IPP, we really had miracles on 18 Oct 2005. Nobody on the very day was aware of the excellency of Silvia KOWOLLIK's work, but it was apparent to us she was hitting timely as such. It was also fortunate for the present writer to be accidentally able to conclude the drama atop Mt Hamilton.

We may say this occurred by chance, but we hope everybody regards this as a good guide, and tries to observe in this "every 40 minutes" way as a new way of the advanced IPP.

Even then, is there anybody who has a good idea to bury the big gap of the Pacific Ocean and a while vacancy following Asia?

Appendix

We here reproduce our communications on 18 Oct by emails. ● implies "received" by *Mn* and *Mk*, and ■ "sent" from *Mn*. The drama was opened by an email of Silvia KOWOLLIK, which reached in the evening (PDT) of 18 Oct:

● · · · Date: Tue, 18 Oct 2005 1:55 GMT (18:55 PDT, 10:55 JST)
From: Silvia KOWOLLIK

To: Masatsugu MINAMI & Masami MURAKAMI
Subject: Chryse very bright and "too roundish" ???

Dear Masatsugu, dear Masami,

1:55 GMT, Seeing here is very poor (3-4/10), but I believe, there is something unusual at Chryse Region. It seems to be too bright and "roundish" - it reminds me of Hellas Basin... best wishes. Silvia

●... Date: Tue, 18 Oct 2005 2:50GMT (19:50PDT)

From: "Masami MURAKAMI" To: "MINAMI, Masatsugu"

Subject: Alarm !! Fw: Chryse very bright and "too roundish" ???/from SKw /

●... Date: Tue, 18 Oct 2005 3:42 GMT (21:43 PDT)

From: Silvia KOWOLLIK

To: Masatsugu MINAMI & Masami MURAKAMI

Subject: seems to be really a dust storm...

Dear Masatsugu, dear Masami,

here a "quick and dirty" added picture between 2 regular avis with only 600 pictures, more I cannot process "live" in 20 minutes... I am going on observing... correct added pictures will follow... Silvia

■... From: M MINAMI (Mt Hamilton)

To: Masami MURAKAMI (Fujisawa, Japan)

Sent: Tuesday, October 18, 2005 4:17GMT

Subject: Urgent

Dear Masami; We did receive emails from Silvia, and so I want to dispatch an Alert to the CMO list. Do you cope with right now? We must do within a few hours. Mn (originally in Japanese).

●... Date: Mon, 18 Oct 2005 4:20 GMT

From: Joel WARREN (JWn)

To: JWn's list

Subject: DUST STORM in Chryse...

Hello everyone, It appears a large dust storm is currently in progress in Chryse. I believe, based on the image, it is 2 clouds, headed south, leaving trails. Much like the 2003 storm. This was imaged LOW on the horizon. Hopefully I can get some better images in the next few hours.

<http://marswatch.amaonline.com/10-17-052225.jpg>

Regards, Joel

■... From: M MINAMI

To: Silvia KOWOLLIK, Cc: M MURAKAMI

Sent: Tuesday, October 18, 2005 4:23GMT

Subject: RE:seems to be really a dust storm...

Dear Silvia, It looks like. Continue to chase. Here I am waiting another two hours, but the conditions are not good. I am now contacting with Murakami. If he becomes ready, I may write an Alert to all.

Just I will send you Grafton's observation last day. With best wishes. Masatsugu (at Lick Observatory)

Chronologically, after sending this email, Mn was aware of and read JWn's email which had reached 3 minutes earlier.

■... From: M MINAMI

To: Silvia KOWOLLIK, Cc: M MURAKAMI

Sent: Tuesday, October 18, 2005 4:35 GMT

Subject: RE:seems to be really a dust storm...

Dear Silvia, It is already caught in the US: see

<http://marswatch.amaonline.com/10-17-052225.jpg>

J WARREN is still chasing. With best wishes, Mn

●... Date: Tue, 18 Oct 2005 4:43 GMT (13:43 JST)

From: "Masami MURAKAMI" To: "MINAMI, Masatsugu"

Subject: Re: Urgent

Dear Masatsugu, At present I am not easy here because our fire alarm is troubled and very noisy. However I think I can stand by until 15hJST. It may easy to use the CMO mailing list from here. I am uploading images from 17 Oct onward, and still updating the Gallery. Mk (in Japanese)

■... Date: Tue, 18 Oct 2005 4:58 GMT (21:58 PDT)

From: Masatsugu MINAMI

To: Joel WARREN, Cc: JWn's list

Subject: RE:DUST STORM in Chryse...

Hi All, We have swiftly received another new image from Silvia KOWOLLIK, Ludwigsburg, GERMANY, made at 2:56 GMT on 18 October. Attached please find her image here. With best wishes Masatsugu Minami, CMO/OAA, at Mt Hamilton (waiting another one hour to catch Mars, but condition looks very poor)

JWn's list contains a lot of addresses: The following are fallen on the CMO list: "Zac Pujic", "Tom Dobbins", "Tim Parker", "Tan Wei Leong", "Sean Walker", "Rolando Chavez", "Roland Christen", "Richard McKim", "Peter Lawrence", "Paulo Coelho", "Paolo Lazzarotti", "Maurizio Di Sciuollo", "Martin Mobberley", "Jim Phillips", "Jesus Sanchez", "Jeff Beish", "Jamie Cooper", "Isao Miyazaki", "Eric Roel Schreurs", "Eric Ng", "Edwin Aguirre", "Ed Grafton", "Don Parker", "David Moore", "David Klassen", "David Graham", "Dave Tyler", "Dave Hunter", "Clay Sherrod", "Christophe Pellier", "Carlos Hernandez", "Brian Colville", "Antonio Cidadao", "Alan Friedman", "Ian Sharp", "Jim Bell",

Yahoo group, which is contained in JWn's list, was rejected from the above RE: as follows:

●... Date: 18 Oct 2005 04:58:44 -0000

From: Yahoo! Groups <notify@yahoogroups.com>

To: VZV03210@nifty.com

Subject: Unable to deliver your message

We are unable to deliver the message from <VZV03210@nifty.ne.jp> to <marsobservers@yahoogroups.com>.

■... From: M MINAMI, To: M MURAKAMI

Sent: Tuesday, October 18, 2005 5:00GMT (22:00PDT)

Subject: RE:Re: Urgent/Mk

Dear Masami, I just sent a message to WARREN's list. Could you forward it to other CMO members without intersection with JWn's list? Mn (in Japanese)

Mn then entered the dome to stay inside because time passed 22h PDT, and he observed from 5:20 GMT to 9:00 GMT. And so next he resumed to read emails around from 9:00 GMT.

●... Date: Tue, 18 Oct 2005 5:12GMT

From: J. WARREN

To: Masatsugu MINAMI; Cc: JWn's list

Subject: Re: RE:DUST STORM in Chryse...

Hello everyone, Here is about an hour and twenty minutes of rotation after my first image. Conditions a bit better, but not what I was hoping for. I'll image again at 06:00 UT and 07:00 UT.

<http://marswatch.amaonline.com/10-17-052340.jpg>

Regards, Joel

●... Date: Tue, 18 Oct 2005 5:15 GMT

From: Ed GRAFTON

To: M MINAMI, M MURAKAMI, R McKIM, D MOORE

Subject: [marsobservers] Mars October 17th

Yes Joel and it is progressing nicely

<http://www.ghg.net/egrafton/m18.jpg>

Ed Grafton

●... Date: Tue, 18 Oct 2005 5:20GMT

From: Masami MURAKAMI

To: Masatsugu MINAMI

Subject: Re: Please reply RE:Re: Urgent

Dear Masatsugu, I read your emails. It is difficult to find the intersection of JWn's list and CMO list, and is it OK if I send out the email (from Mn to JWn) to all CMO list? I am ready to upload WARREN's images as well as SKw's images. Mk (in Japanese)

●... Date: Tue, 18 Oct 2005 5:21GMT

From: J. WARREN

To: <marsobservers@yahoogroups.com>

Cc: M MINAMI, M MURAKAMI, R McKIM, D MOORE

Subject: Re: [marsobservers] Mars October 17th

Looks like 2 central cores, leaving trails as I had suspected. Looking at your excellent image Ed, it appears they are headed in different directions based on the trails, but I don't know how likely that is. Congratulations on capturing it so early in formation. Regards, Joel

●... Date: Tue, 18 Oct 2005 6:05GMT

From: P. Clay SHERROD

Subject: Re: DUST STORM in Chryse...

I confirm this very bright and distinct, segmented new feature, centered near CM 57 degrees; we are imaging it at this time and getting good results. The dust has the character of a "V", with pointing toward the north. Dr. Clay

●... Date: Tue, 18 Oct 2005 6:49GMT

From: Silvia KOWOLLIK

To: M MINAMI & M MURAKAMI

Subject: first correct added Dust storm at 2:44 GMT

Dear Masatsugu, dear Masami,

> It looks Like. Continue to chase. Here I am waiting another two

> hours, but the condition are not good.

Seeing was terrible the whole night, bit i took avis until 5:04 GMT, then Mars was too deep over the rooftops, the sky was blue and I had no more contrast...

This is my first correct added Mars from 2:44 GMT (= 7°W), I have to process 14 more pictures (0:44 - 5:04 GMT). How Exciting!!! best wishes

●... Date: Tue, 18 Oct 2005 6:59GMT

From: "Masami MURAKAMI" <cmo@mars.dti.ne.jp>

Subject: Fw: RE:DUST STORM in Chryse...

(This is sent to the CMO members via BCc)

----- Original Message -----

From: "Masatsugu MINAMI" <VZV03210@nifty.com>

Date: Tue, 18 Oct 2005 4:58 GMT

Subject: RE:DUST STORM in Chryse...

●... Date: Tue, 18 Oct 2005 8:22 GMT

From: Joel WARREN

Subject: Re: RE:DUST STORM in Chryse...

Hello all, Here is the rotation of the dust cloud over the period of 4 hour sor so. I believe in the 3rd image you can tell it has grown in that time span, but not sure. Been a long night! I hope someone was able to image who had better seeing. This is a big file, so you might need to click the lower right corner to enlarge it to get all the details.

<http://marswatch.amaonline.com/10-18-05finals.jpg>

Regards, Joel

●... Date: Tue, 18 Oct 2005 8:37GMT

From: Donald PARKER

Subject: Dust cloud in Chryse

Hi All, I have attached some Mars images from 17 and 18 October show-

ing the rapid appearance of a dust cloud in southern Chryse, first detected by Ed Grafton and Clay Sherrod on 17 October. Best, Don

●... From: M MINAMI (Mt Hamilton)
To: M MURAKAMI (Fujisawa, Japan)
Sent: Tuesday, October 18, 2005 9:15GMT
Subject: RE:Re: Please reply RE:Urgent

Dear Masami, I just returned from the big dome to the waiting room. I was late because I had observed 6 times every 40 minutes staying continuously inside the dome. I checked just now CMO Gallery. It looks OK. Upload soon Don PARKER's images. I shall write an English notice soon. And please sometimes check the emails including from me. Mn (in Japanese)

●... Date: Tue, 18 Oct 2005 9:56GMT
From: Ed GRAFTON
To: marsobservers@yahoo.com
Cc: M MINAMI, M MURAKAMI, R MCKIM, D MOORE
Subject: [marsobservers] Mars October 18th

Here are images of Mars taken October 18th 2005 from Houston Texas. The dust cloud has moved south quite a bit since yesterday and several core concentrations are visible. It appears another cloud of sorts is on the limb but it is too far from the CM to tell much about it.

<http://www.ghg.net/egrafton/mo-18-05.jpg>
C14 at f/39, taken with a ST402 CCD. Seeing 7/10, Transp. 7/10, Temp 68.7F, Relative Humidity 69%, Red/Grn/Blu @ 80% scale.

●... Date: Tue, 18 Oct 2005 10:21GMT
From: Jim PHILLIPS

To: M MINAMI, J WARREN
Subject: RE:DUST STORM in Chryse...
TMB 8" F/9 2X Barlow into 3X Barlow
Seeing 7/10 7:00 - 7:03 UT October 18, 2005, Jim Phillips

●... Date: Tue, 18 Oct 2005 11:02GMT
From: Martin GASKELL

To: Masami MURAKAMI, Cc: MINAMI, Masatsugu
Subject: Re: Fw: RE:DUST STORM in Chryse...

The off-again-on again dust activity in Chryse is definitely on again! I took the attached image of Mars at 04:41 UT on 2005 Oct. 18. At around 07:30 UT there was a much larger light area over Chryse. It was perhaps a mixture of dust and clouds. It was the brightest thing on the center of the planet (much brighter than it had appeared earlier visually and also much lighter than in the attached photo), but it was a pale white, not yellowish. I tried to image it I could not get the images right. What I saw tonight is one of the fastest changes I've seen on Mars. Martin Gaskell

●... From: M MINAMI
To: M MURAKAMI
Sent: Tuesday, October 18, 2005 12:29GMT
Subject: Notice mail

Dear Masami, I am late because the Internet is sometimes disconnected, and I talked long with Laurie, but could you send out the attached Notice to the CMO list? Here already 5 o'clock in the morning. With best wishes Mn (in Japanese)

●... Date: Tue, 18 Oct 2005 13:15 GMT
From: Bill DICKINSON
To: "Masami MURAKAMI" <cmo@mars.dti.ne.jp>
Subject: Mars 20051018 DUST STORM in Chryse

Here is an image from this morning taken during poor seeing showing the Chryse dust storm.

http://members.verizon.net/~whd/images/20051018_whd.jpg
Regards, Bill Dickinson

●... Date: Tue, 18 Oct 2005 13:43GMT
From: Masami MURAKAMI

Subject: Dust storm at the southern Chryse
(This is sent to the CMO members via BCc)
<http://homepage2.nifty.com/~cmomn2/DN2005/frame1.htm#Date>

●... Date: Tue, 18 Oct 2005 14:19 GMT
From: Robert HEFFNER (at Nagoya, Japan)
To: "Masami MURAKAMI" who Fw'ded to Mn at 15:20 GMT
Subject: RE: Dust storm at the southern Chryse

Minami-san, Thank you for the mailing post about the dust storm. I have been following it closely on the Yahoo! Mars Observers group.

Question: If this develops into a global storm, how long will that take from now? I'm wondering if I should concentrate some serious efforts on getting in some "last" shots of detailed Mars this week before it's too late. How much time do we have left if this is "the big one"? Robert

●... Date: Tue, 18 Oct 2005 15:40GMT
From: S WALKER <swalker@SkyandTelescope.com>
Subject: Mars 10-18: Dust cloud

10-18-05, 3:04 UT IRRGB, 7" MN @f/50
Seeing: very poor (surprised it came out this good!). Sean W.

●... Date: Tue, 18 Oct 2005 19:17 GMT
From: Christophe PELLIER
Subject: Preliminary results for oct.17th dust

Hi all, just a message to send more interesting data on this new dust storm. It seems that it has been observed in France a few hours before Ed's observation in its first stage, extending from the NPH west of Nilokeras.

<http://www.astrosurf.org/pellier/nilokerasdust>
(the cloud seen on Ed's image may be barely visible)

This looks to be a new one, that's also coming from the Acidialium low

pressure.

Masatsugu, we're therefore maybe not able to test there your hypothesis of the re-built dust cloud in the morning! I had some doubts on my images, which can't be completely self-speaking, but here are two links to images taken after me that show clearly a yellow zone just west of Nilokeras.

<http://www.fotoes.com/images/Mars/1710/5h13mWeb.jpg>
(Stemm, with a C8)

<http://photos.lacoccinelle.net/42/78/204278.jpg>
(Rolf Arcan, with a 16" newtonian)

Best wishes, Christophe

●... Date: Tue, 18 Oct 2005 21:53GMT
From: Silvia KOWOLLIK

To: Masatsugu MINAMI & Masami MURAKAMI
Subject: mars pictures yesterday/today

Dear Masatsugu, dear Masami, here are my first results, I tried to compare yesterday's pictures with today's pictures... more pictures will come soon... best wishes, Silvia

●... Date: Tue, 18 Oct 2005 22:04GMT

From: Damian PEACH
Subject: Mars images (October 18th, 2005.)

Hi all, Here are some images from last night. Again poor to fair seeing. Note the dense evening mist over Libya. Also the Chryse dust cloud can just be seen in the images at the morning limb appearing brilliant.

http://homepage.ntlworld.com/damian.peach/2005_10_18rgb_DAP.jpg
http://homepage.ntlworld.com/damian.peach/2005_10_18blue_DAP.jpg

Best Wishes, Damian

●... Date: Wed, 19 Oct 2005 02:18 GMT
From: David ARDITTI

Subject: Mars Oct 18

This, the last of a series I took this night, shows dust or cloud activity both in Libya and Chryse, on opposite sides of the planet, evident in the shorter wavelengths. David

●... From: Masatsugu MINAMI

To: Silvia KOWOLLIK, Cc: M MURAKAMI
Sent: Wednesday, October 19, 2005 3:45 GMT

Subject: RE:Dust storm over Chryse continues...

Dear Silvia, Thank you for information. Continue, and take pictures at the same "angles" as yesterday. Did you take at 007°W? With best wishes, Masatsugu (@Mt Hamilton)

I 黄雲が問題になってから半世紀が経つが、黄雲がどの様に生まれ、どの様に發展するかには就いては未だ確固とした理論はないようである。その大きな原因の一つは確固とした収斂する観測が揃っていないことに據ると言える。いろいろな考えを醸すほどの際だった観測もなければ、そういう考えを支持したり或いは排除したりするほどの観測も揃っていないというのが現状だからであると思う。

先ず第一に、黄雲の観測は仰山あるが、黄雲が発生した場合、時間的に追跡したものは殆どなく、特に朝方の観測は僅少である。1956年のノアキス大黃雲は黄雲が火星の氣象に於いて重要な要素であることを示す観測が揃っているが、その初期の観測は夕方の黄雲に限られている。當時午後のノアキスは日本から追えたのであるが、残念ながら太平洋というギャップが大きすぎ、従って、日本に先行する観測がなく、朝方のノアキスの観測は知られていない。當時、(1955年頃であろうか)国際火星委員会なるものがローエル天文臺の音頭で作られてはいたが、筆者(Mn)はあまり事情を知らない(田上天文臺の国内火星委員会にもローエル天文臺から乾板が送られて来たが、神戸の税関で

ストップしたという話がある)。

実際に所謂ローエル天文臺主導の IPP が動き出したのは 1969 年からで、これの概要や初期の成果については W.A.ボーム氏の "The International Planetary Patrol Program: An Assessment of the First Three Years, *Planet. Space Sci.* **21** (1973) 1511" が参考になる。ネットワークには Mauna Kea、Flagstaff のほか、Cerro Tololo (北部チリ)、ヨハネスブルクの Republic 天文臺(昔 Union 天文臺)、南インドの印度宇宙物理研の Kavalur 観測所、西澳大利ヤの Perth 天文臺、東澳大利ヤの Stromlo 山天文臺が含まれる。ほぼ同じ焦点距離で、同じカメラシステムで撮っていた様である。唐那・派克さんが Cerro Tololo の 61cm カセグレンを操っている写真をご覧になった方もいよう。このプログラムには最初 New Mexico 州立大も参加したようだが、脱落、Mt.Stromlo も最終的に抜けたようである。そうすると、ハワイ迄は遠くなる上(五時間以上か)、カナリア群島の邊が入って居ないのも大西洋のギャップが大きい(矢張り五時間以上)。1971 年の畫像の代表的なものは、S&T 誌 1971 年十一月號 p262 などに掲載されているが、同じ年の 25cm の堀口令一氏の畫像と然程優れているわけではない。観測者もマーティンを除き聞いたこともない人たちであるが、総合的な時間的な配分は流石である。こうして、虚像も含みながら、十分な成果があったように思うのであるが(一部後述)、結局、ロケットが飛ぶようになって、ローエル天文臺はその後、方針轉換し、地上からの IPP は潰れて了ったようである。

尚、上のボーム氏の文獻では "このプログラムの目的は切れ目のない連続した観測を行って、その結果、惑星の大氣や表面模様の day-to-day および hour-to-hour の大域的な變化を追求しようとするものである" とあるから day-to-day だけでなく、hour-to-hour の結果も目標としている様であるが、day-to-day の結果は要領よく擧がっているものの、hour-to-hour の方法や結果については好く書かれていない。たとえば極冠の周邊のギザギザを計るには hour-to-hour が必要とされるとは言っているが、有名なフィッシュバツヒエル達の南極冠溶解の測定も苦節六十年に亙るローエル天文臺の結果と併せて同じ季節でいろいろな角度を探し出している可能性もある。ただ、1903 年から 1968 年までのローエル天文臺の撮影数は 10086 冊(多分 14

個綴りの像からなる)のに対し、IPP の 1969 年から 1971 年までの数は 56000 冊だそうである(火星だけではない)。(スライファールによると 1903 年から 1960 迄のフラグスタッフにおける火星像は 126000 個。)

最近アマチュアの ccd 観測家が増え、アメリカ国内、東洋と澳大利ヤ、それに歐羅巴に於いてはローカルなネットワークが稠密になっていて、IPP に代わるものとなっている。但し、太平洋とアジアから歐羅巴の間のギャップは依然大きい。

なお、MGS などが動いていることで、もうエエじゃないか、と仰有る向きもあるのだが、これは day-to-day だけであって、今回考える hour-to-hour には全く無力である(事はローエル天文臺の幹部も知らないのではないか--後述)。

II. 火星の場合もともとどうして全世界に観測網を持たねばならないかという、火星の自轉周期が地球のそれに似ているからである。相對速度も考慮すると、ほぼ 40 分ばかり向こうの方が長い。その爲翌日同じ時刻に覗いても 40 分ほど、角度にして 10° 程ずれているにすぎない。巡り巡って 36 日強(實際には 40 分で正確には $10^\circ W$ ではないので、40 日ほど)待てば、同じ火星面が覗けるが、現象はそんなに待ってはくれない。而も、一夜四時間観測したとして、 60° しか動いてくれない譯であるから、火星の 1/6 面しか見られないことになる。従って、その日の火星全體を hour-to-hour で把握するには 60° 毎に六ヶ所の観測所が要る事になる。

然し、day-to-day の考え方で發想を換えると、毎夜、40 分ずつ遅らせて観測すれば同じ火星面を眺めることが出來、最終的に四時間遅らせれば、六日も同じ面を観ることが出來、比較が出来るのである。衝の頃であれば、四時間どころでなく、七時間は可能であろうから、この頃には同じ面を 10 日ほど追えることになる。

而も、一般に特殊な面というのはあり得ないから、毎夜、同じ時刻に観測し、それを四十分ごとに繰り返せば、比較可能な角度は増えてゆく。但し、40 分というのは正確ではなく、逆に 40 分では 9.8° を越えない(近日點前と後でも違ってくる)から、その時々で補正をしなければならない。自然と四十分刻みでは數回置くと 1° ずつ減ることになることは仕方がない。

繰り返すと、簡便なパトロールというのは day-to-day の観測だけでは充分ではなく、やはり hour-to-hour (正確には 40 minutes-to-40 minutes) の観測も重要であり、day-to-day のことも考慮しておくことと一夜 60° 乃至 100° の観測幅を満たしておくことは必要である、ということである。ccd 像の場合は廿分ごとに像を整えると、二つの連鎖が可能である。通常、福井市自然史博物館天文臺で中島孝氏と筆者は廿分間観測して、お互いに繰り返すので、丁度四十分ごとになる。

day-to-day の結果としては森田行雄(Mo)氏の 2001 年の黄雲を 1July から 4July まで追った好例がある:

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn2/Mo1-4July01.htm>

一方、hour-to-hour を加味した例としては古くは CMO #096 p816 にあるが、Web では

http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn2/1990oct_nph.gif

に採録されている。また最近では

http://homepage3.nifty.com/~cmomn3/Mn_July03Cloud.jpg

などが例である。最後の例では、然し、残念ながら、黄雲の朝方の観測が無いことに注意する。この点 2005 年十月黄雲では事情が好轉した。

但し、ここでは、18 Oct 2005 に限って追求するので、day-to-day の話は出てこない。尚、一時間毎の観測でもいいじゃないかと仰有る天の邪鬼もおいでと思うが、毎日同じ角度を出してご覧サイ、と言いたい。自轉速度は変わらないわけであるから、40 分という呪縛からは逃れられず、毎夜毎夜煩瑣な事になるのは請け合いである。従って算術に弱い人間はゴタゴタ言わずに同じ時刻に四十分毎というのは天の恵みと考えれば宜いのである。

III. 扨て、四十分毎の観測で 17 Oct~18 Oct 2005 ($\lambda=308^\circ\text{Ls}$)には奇跡のようなことが起こった。発生した黄雲を朝から夕方までパトロールすることは我々としては待ちに待った重要なことで、これが意識的に成功したのは今回が最初ではなかったかと思う。この日には CMO に報告された観測数は 17 Oct GMT の後半、マッキム(RMk)氏の $\omega=304^\circ\text{W}$ の観測から数えれば四十葉程であるが、先ず歐羅巴で朝方観測され、無事大西洋を横切って美國大陸で重なる形で観測が開始され、西海岸で(太平洋に入る前に)終わったという幸運があっ

た譯である。

第一の活躍の功勞者にコヴォツリク(SKw)さんが挙げられる。彼女は以下の附録でもう一度示すように、最初にこの黄雲に氣附いた人であり、また我々に最初に(1:55GMT に)通知してきた人物で、CMO 方法の忠實なメンバーが緒に就いたというのは誠に幸運であった。彼女は 01:45 GMT から 05:04 GMT まで廿分ごとに十一葉の畫像を次のように揃えた。廿分毎というのは CMO の方法に據っているわけである(四十分間隔のシリーズが二つ出来る):

SKw 01:45 GMT $\omega=353^\circ\text{W}$

SKw 02:04 GMT $\omega=358^\circ\text{W}$

SKw 02:24 GMT $\omega=002^\circ\text{W}$

SKw 02:44 GMT $\omega=007^\circ\text{W}$

SKw 03:04 GMT $\omega=012^\circ\text{W}$

SKw 03:24 GMT $\omega=017^\circ\text{W}$

SKw 03:44 GMT $\omega=022^\circ\text{W}$

SKw 04:04 GMT $\omega=027^\circ\text{W}$

SKw 04:24 GMT $\omega=032^\circ\text{W}$

SKw 04:44 GMT $\omega=037^\circ\text{W}$

SKw 05:04 GMT $\omega=041^\circ\text{W}$

大西洋を越えて美國での最初の観測はウォーカー(SWk)氏の 3:04GMT の $\omega=012^\circ\text{W}$ であるから、この頃から歐羅巴と美大陸が同時に観測可能となっているわけで、時間的に大西洋は障害になっていない。唐那・派克(DPk)氏は SKw 氏と同じ 04:25 GMT $\omega=032^\circ\text{W}$ で R 像を得ている(その前後で G と B 像)。他にディッキンソン(WDc)氏が 04:20GMT $\omega=031^\circ\text{W}$ 、ガスケル(MGs)氏が 04:41 GMT $\omega=036^\circ\text{W}$ で撮っている。

美國での最初の功績はウォーレン(JWn)氏による。彼は 3:23GMT $\omega=017^\circ\text{W}$ に撮像し、黄雲に氣付き email で通知を流す(04:20GMT)と共に、次のように撮像した。

JWn 03:23 GMT $\omega=017^\circ\text{W}$

JWn 04:40 GMT $\omega=036^\circ\text{W}$

JWn 06:50 GMT $\omega=067^\circ\text{W}$

4:40GMT の畫像は 05:12GMT に到着したが、それに先だって 4:58GMT に筆者(Mn)は SKw さんの結果から JWn 氏宛に confirmation を出した(Appendix 参照)。05:12GMT の JWn 氏の email には 06:00GMT、07:00GMT に撮るつもりとあるからこの人は四十分間隔の意味を知らないわけである。

三番目の貢獻者はクレイ(CSr)博士である。どう

いう譯か次のように美事に撮り分けている。

CSr 05:01 GMT $\omega=041^\circ\text{W}$

CSr 05:40 GMT $\omega=050^\circ\text{W}$

CSr 06:22 GMT $\omega=060^\circ\text{W}$

CSr 07:02 GMT $\omega=070^\circ\text{W}$

奇跡的に、SKw さんが西に火星を見送ったときに美國中部で CSr 氏が捉え、四十分ごとに二時間更に延長して追ったことになる。但し $\omega=041^\circ\text{W}$ の像は少しずれているらしいので採用しない。 $\omega=050^\circ\text{W} \sim \omega=070^\circ\text{W}$ では、WDC 氏の $\omega=051^\circ\text{W(R)}$ 、メリッロ(FMI)氏の $\omega=052^\circ\text{W}$ 、グラフィトン(EGf)氏の $\omega=065^\circ\text{W}$ 、フラナガン(WFI)氏の $\omega=066^\circ\text{W}$ 、 072°W 、フィリップス(JPh)氏の $\omega=070^\circ\text{W}$ などが挟まる。

筆者(Mn)の滞在した西海岸のリック天文臺では、ほぼ SKw さんの終了後暫くしてから観測可能となって(これは SKw さんが相当火星の低くなるまで西で追い、筆者は相当早く火星の東で低いうちから観測を開始した事を意味する)、次のように追ったが、SKw さんの $\omega=037^\circ\text{W}$ をほぼ 40 分後に継ぐ形になっている:

Mn 05:30 GMT $\omega=048^\circ\text{W}$

Mn 06:10 GMT $\omega=057^\circ\text{W}$

Mn 06:50 GMT $\omega=067^\circ\text{W}$

Mn 07:30 GMT $\omega=077^\circ\text{W}$

Mn 08:10 GMT $\omega=087^\circ\text{W}$

Mn 08:50 GMT $\omega=096^\circ\text{W}$

実はこの後リックではハッチ(LHt)さんが續けて観測し、黄雲の沈むところを捉えている。彼女のカラー・スケッチは一時間ほど費やされ、ほぼ 10GMT まで観測していたから、観測時を 09:30GMT とすると $\omega=106^\circ\text{W}$ となる。

一方、SKw さんの前を行く観測も後で報告された。RMk 氏の後、ヴァレル(JWr)氏が $\omega=309^\circ\text{W}$ 、ピーチ(DPc)氏が $\omega=323^\circ\text{W}$ 、 326°W 、タイラー(DTy)氏が(ここから 18OctGMT) $\omega=329^\circ\text{W}$ 、アルディッチ(DAr)氏が $\omega=336^\circ\text{W}$ 、アデラル(JAd)氏の $\omega=344^\circ\text{W}$ の画像がある。DAr 氏の画像以後は黄雲が明確である。この邊りの問題は次の項に譲るとして、以上から 40 分観測は二通り得られたわけである。一つは英分部の Table I を参照

英文の部に掲載したファイルはこの十圖を並べたものである。

一方、SKw さんのもう一方の枝からは Table II

の並びが得られる。英文の部の Table II を参照。後者では $\omega=347^\circ\text{W}$ 邊りの缺落が残念だが、ほぼ九時間半に及ぶ追跡で、角度は 150°W に及ぶから、 $\tau=18^\circ$ であった事を考えると、多分かつて無い成果であろうと思う。

IV. 扱て、時間毎の朝から晩までの観測が何故重要かということは、いろいろあると思われるが、一つは、観測が IPP 以外は例が多くないことと、IPP での結果については異論があることである。このことは一度 CMO で挑戦的に扱っているが (CMO #256 (25 Jan 2002)、或いは Web では

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn0/01Note02j/index.htm>)。

ここでは紹介をやや詳しくしてみる。

海老澤嗣郎氏とドルフェス氏の共著の "Martian Dust Storm at the Early Stage of Their Evolution" *Icarus* **66** (1986) 75 の中で、彼らのそれまでの黄雲の観測、特に 1971a の眼視による経験からから、ケーペン氏の "A Martian Yellow Cloud-- July 1971" *Icarus* **22** (1974) 345 の中での述べられた事に對して異論を述べた譯である。ケーペン氏の論文はなかなかの労作で IPP の写真結果から 1971a 黄雲の発生から十二日間を詳しく追ったもので、特に第一日目は午前と午後に分けて圖示している。海老澤氏達の文章をそのまま引用すると "Capen stated that the cloud was first seen as an irregularity on the morning limb, but as it rotated onto the visible disk it expanded east-west and had the same appearance and location as the initial clouds of the dust storms observed in August 1956, May 1969, and September 1971. He went on to describe the storms' changes and expansions that took place hourly throughout the day." と先ず要約する。最後のフレーズをケーペンの原文でもっと詳しく紹介すると、"Weak obscuration appeared in western Hellas and at the east end of Sabaeus Sinus about noon. By mid-afternoon these active areas had brightened and coalesced to form an elongated cloud with a north-east major axis and a short, west component."

これに對して海老澤氏達は "Conversely, our visual observations of the same night (10-11 July) indicated that the yellow component of this cloud did not appear to expand but maintained nearly the same sharp boundary throughout the Martian day. We also observed an obscuration over Hellas which was yellowish white and

in contrast with the principal bar-like pure yellow cloud. Subtle color differences are easier to identify visually, enabling us to readily distinguish between yellow dust veils and adjoining white clouds, even when several clouds of different natures are intermixed or near the limb.”

午後の部の観測では、ケーブン氏は一時間毎四回の観測を使っている。

実際、海老澤氏のスケッチとケーブン氏が写真から起こした輪郭とは相當に違うとあって好く、これは当時の乳剤の粒子の問題とコントラスト感度に據るとして、Fig.6 に 1956 年の黄雲発生日の村山定男氏の写真から海老澤氏が輪郭を起こし、それと海老澤氏自身のスケッチと比較して、その違いを強調している。写真では CM 附近で膨らんでおり、眼視で観る輪郭と違うわけである。この批判を度外視すると虚像が出来る。この論文のレフェリーは R W ZUREK と L J MARTIN であった。

こうした写真からのトレースに據って得た情報に違和感が多少あるのは矢張り CM から noon 線かけて黄雲が明るくなっていることで、マーチン氏は 1971b についても 1973 黄雲についても十一日目(夫々 3 Oct 1971 と 23 Oct 1973)の二時間毎の輪郭を出しているが、これを見るとまるで十二時間に渡って明るい黄雲がソリス・ラクスからマレ・エリュトウラエウム上空、更にノアキス、ヘッラスへと動いているように見える(レオナード・マーチン"1973 Dust Storm on Mars: Map from Hourly Photographs" Icarus 29 (1976) 363 の Fig.6 には両者並べて出ているので参照されたい)。十一日目では拡散が強くなっているであろうが、輝部をトレースするのは拙いように思う。W.A.ボーム氏のもう一つのレジユメ"Results of Current Mars Studies at the IAU Planetary Research Center, in Exploration of the Planetary System pp241-251 (edit. Woszezyk and Iwaniszewska, 1974)"で、1971b の十一日目の圖を擧げて、"We find, in fact, that the dust storm seems to be locally regenerated in this manner about midday each day during its developing stages"と述べているのはどうであろうか。これは写真による虚像であろう。今回の例からしても、また我々の経験でも CM や noon 附近での regeneration などというものは見られない。但し、海老澤-ドルフ

ユス論文では、このボームの文獻が入って居ない。

海老澤嗣郎氏の 1956 年と 1971 年 a 黄雲の経験では発生時の黄雲はくっきりとした輪郭に囲まれ、時間と共に動きはなく、ターミネータ近くでも同じでそのまま沈んで行くというものであるが、ただ、海老澤氏の場合はどちらとも午後部にのみ關している事には注意する。2003 年七月 4 日の沖縄での経験も矢張り午後だけであって、而も黄雲はシャープな境界ではなくギザギザとして、灣曲していたが、動きが無く全く大きな變化を見せず静かに沈んでいったのは同様であった。IPP ではリアルタイムに追っているわけではないから、神経の使い方は足りない。

今回は、その意味で、この問題に大きく貢献するデータの得られたことは確かである。この項は連続観測の必要性を述べ、18Oct2005 の成功を述べる爲のもので、詳細を論ずるのは別の機会に譲るが、発生した黄雲に朝から夕没まで殆どマクロな動きのないことは確かな様である。

V. 扱て、今回はもう一つ重要な問題に關わっている。それは発生黄雲の朝方の把握である。地上からのこの例は殆どないと思う。何故朝方が重要かという、前日に黄雲が無く、お昼に發達が無いならば、夜間に大きな動きは無いであろうから、朝方に何かあると考えるほか無いからである。多分、多くは黄雲は日射の強いお昼に発生すると考えるのは、矢張りマーチン-ボーム流の描寫が幅を利かせているからであろう。然し、發達した黄雲がお昼に動きを見せないことから、筆者は発生黄雲も朝作られるという考えも持って居る。

その意味で、DTy 氏の $\omega=329^\circ\text{W}$ 、DAr 氏の $\omega=336^\circ\text{W}$ 、JAd 氏の $\omega=344^\circ\text{W}$ 、SKw さんの $\omega=353^\circ\text{W}$ の畫像が重要である。DAr 氏の像では R で詳細がやや見られ、黄雲が明白であり、JAd 氏の像で見られる朝方黄雲は殆どその後の形を見せている。

ただ、残念なのはこのとき $t=18^\circ$ で、ほぼ朝方一時間以上観測不可能になっていることである。DTy 氏の場合、リムのエッジは $\Omega=041^\circ\text{W}$ であって、その後の観測では黄雲の東端はそのぐらいであろうと思われるから黄雲は向こう側に発生していると思われる。

もう一つ今回の重要な結果は、この黄雲初期状態が水蒸氣を持っていることである。これは既に

DTy 氏の B 像に出ているほか、DAr 氏の G 像、B 像に明白である。この水蒸気は午後遅くまで持ちこたえていることは、WFI 氏の $\omega=066^\circ\text{W}$ 、 072°W の B 像で極めて好く出ている。

朝方の発生黄雲の地上からの観測は殆ど無いと思うが、矢張り 1971 年の IPP では引っ掛っている。ただ、1971a の場合 $\iota=25^\circ$ であるから、今回よりも分が悪かった筈である。先のケーペン氏の論文では 10 July 1971 の 19:26GMT の R 画像が出ている。 $\omega=247^\circ\text{W}$ であるから、エッチは $\Omega=312^\circ\text{W}$ となり、黄雲部はディスク内に入って居るのだが、筆者の持っているのはリプリント(ローエル天文臺の No142 のハンコ)で、ゼロックスではないのであるが、それでもあまり明確とは云えない。もう一つ B 像はうまくないらしく 21:59GMT $\omega=284^\circ\text{W}$ の UV には出ていない。写真の質は全體に好くないと思う。

1971a の発生状態については、CMO で既に紹介済みであるが、先に二番目の文献でボーム氏がいみじくも次の様な報告をしている:“1971年の九月の21日には何の異常な證據も見られなかったが、翌日の早朝、ノアキスが朝縁から顔を出すときには黄雲が顕れ、その後続く日に見られた黄雲のどの部位よりもより白く輝いていた。”この時は衝後であって(10Aug が衝)、 ι は 30° に達していたから、朝方が相当内部で見えた好条件であった譯である。多分、ヨハネスブルグで撮られた写真に據っていると思う。重要なのは whiter とあることで、B 光での観測が有効であった譯である。明らかに黄雲発生には水蒸気が大きな働きをしていることは明らかで、これは 1956 年のノアキス黄雲の際、宮本正太郎氏が指摘していたことである。宮本氏の観測は 20Aug1956 は $\omega=333^\circ\text{W}\sim 338^\circ\text{W}$ で午後側だが、“The cloud on the night of 20 August was white in color and its brightness was next to the south polar cap.”とあり、別章で“may be called the “yellow cloud” because of its white-yellowish tint. But the present cloud, at least, may possibly contain some amount of water vapour.”(Contri. Inst. Astrophys. and Kwasan Obs. Kyoto Univ. No.71 (1957))と明言している。

今回の朝縁での水蒸気検出は上の意味で価値があると思う。DPc 氏は夜半(GMT)前に $\omega=328^\circ\text{W}$ 、 333°W などで既に B でこれを出していると思う。DPc 氏には一周前の 17OctGMT 午前に $\omega=340^\circ\text{W}$

で B 光を撮っている。角度はずれているが、水蒸気はまだ弱いと思われる。

VI. IPP は先にも述べたように 1969 年に開始されたが、1971 年と 1973 年の火星で成功した後、1974 年には三天文臺のみに縮小され、ヴァイキングの飛んだ 1976 年には停止してしまったようである。理由は探査機の時代に入ったということが利いている。ローエル天文臺もスライファー氏とかケーペン氏とかマーチン氏を雇っていたのであるが、マーチンは 1997 年四月に 67 歳で心臓病で亡くなって(シーハン氏に據れば、彼の“The Planet Mars” (Arizona Univ Press 1996)の書評を S&T に書いたのが單獨で書いた最後の原稿ではないか、と言っている。共著の論文は 1997 年七月の “HST Observations of Early Spring Dust Storms in the North Polar Region of Mars” Bull. A.A.S 29 (1997) 961 が最後のようである)以降、もう火星専門家を雇わなくなった譯である(ボーム氏は 1984 頃にはもう火星から離れているし、1990 年代初頭には去っている)。ローエル天文臺の意向では、もはや火星は天文家の興味を持つところではなく、地質學者の対象となったと考えているようで、シーハン氏の皮肉のところでは “There was no more reason for the observatory to hire a Mars expert than to hire an expert on the Grand Canyon!” という譯である(これは彼の書く次の火星の本に顕れる筈)。ローエル天文臺では確實にスライファーやケーペン、マーチンの時代は終わった譯で、火星の連続観測は度外視されてしまった。

然し乍ら、探査機時代が何かもすべて解決した譯でもなく、解決されつつある譯でもない。情報解析も成されないわけだから、ところどころに遮断が起こっている。HST と雖も 2001 年の大黃雲の初期を撮ることに失敗したという體たらくになったのは當然であった。MGS は動いているけれども、何度も強調する様に、これは全面に互るとはいえ、午後 2 時の映像でしかなく、限られた角度の day-to-day にしか過ぎない。最近のプロの仕事は MGS 止まりである。

その意味で、地上ではうまく未だ組織されていないにも拘わらず、18 Oct 2005 は奇蹟であったという譯である。SKw さんの業績は「その当日」虚々實々の人達には解らなかつただろうと思うが

見事な貢献の進行していることはわれわれにはリアルタイムに明白であった。筆者がリックにいて最後を締め括ったというのも奇縁であった。黄雲の兆候があるにも拘わらず、歐羅巴の多くは天頂だけの良像を撮って寝てしまった譯で、SKw さんの場合があり得たのは、いくら偶然が好い方に重なったのであるが、この例を参考に、連絡を

取り合いながら今後は四十分ごと観測が行き渡って、IPP の新しい形に進化して欲しいと思う。

それにしても、太平洋と東洋と歐羅巴の間に横たわるギャップが埋まるようなアイデアがないものかと思う。

附録：英文の部の APPENDIX で 18Oct 当日の email のやりとりを再現している。

CMO 2005 Mars Report #25

OAA Mars Section

♂.....追加報告：オーエンス (LOW) 氏の 13July2005 から 28Aug2005 迄の報告は既に CMO#309 Report #10 (p0171, p0178) で紹介済みである。ここでは、1Sept2005($\lambda=280^\circ\text{Ls}$)から 1Feb2006($\lambda=005^\circ\text{Ls}$)までの追加報告を取り扱う。カラー画像は ToUcamPro、単色光画像は SONY 製の別の受光素子を使ったカメラを使って取り分けている。画質はよいのだが、19Oct の黄雲時以外毎日一画面ずつの報告なのが惜しいところである。

♂.....WE FURTHER RECEIVED: Larry OWENS (LOW)'s images taken during the period from 13 July 2005 to 28 Aug 2005 were already reported in CMO #309 Report #10 (p0171, p0178). Here we shall review his work made during the latter period from 1 Sept 2005 ($\lambda=280^\circ\text{Ls}$) to 1 Feb 2006($\lambda=005^\circ\text{Ls}$), which we received later. The colour images were produced by ToUcam Pro, and monochromatic images by another camera equipped with a different Sony chips. All look excellent, while no more than one images a night except for the second day of dust on 19 Oct.

OWENS, Larry ラリー・オーエンス (LOW) Alpharetta, GA, USA

23 CCD Images (1~3, 9, 13, 18, 20, 21, 23 Sept; 14, 19, 27, 30, 31 Oct;

8, 26 Nov; 7, 22, 28 Dec 2005; 1 Feb 2006)

$f/36 \otimes 35\text{cm SCT}$ with a ToUcam Pro & Sony Monochrome CCD based camera

♂.....1Sept2005($\lambda=280^\circ\text{Ls}$, $\iota=42^\circ$) $\omega=172^\circ\text{W}$ と 2Sept2005($\lambda=281^\circ\text{Ls}$) $\omega=165^\circ\text{W}$ 、3Sept2005($\lambda=281^\circ\text{Ls}$) $\omega=155^\circ\text{W}$ の画像は、ワルハッラが描写されている(CMO#309p0178 参照)。夕方にはアルシア雲とオリュムプス・モンスの蔭が暗点に見えている。午前側にはプロポンティスが二つの暗点に分解している。1Sept の画像にはエリュシウム・モンスが朝方で輝点に写っている。9Sept2005 ($\lambda=285^\circ\text{Ls}$) $\omega=095^\circ\text{W}$ の像には、B 光画像に小さくアルシア雲、地方時で 13h ほど(CMO#309 p0176)。小さな南極冠には亀裂(CMO#309p0176)。13Sept2005($\lambda=287^\circ\text{Ls}$) $\omega=050^\circ\text{W}$ では、テムペの北の北極雲の描写が良い(CMO#309 p0178)。部分拡大画像があり、雲塊の集まりに見える。18 Sept 2005 ($\lambda=290^\circ\text{Ls}$) $\omega=014^\circ\text{W}$ では、マレ・アキダリウムにかかる北極雲とドーズスリットの描写がある(CMO#310p0202)。ヒュダスペースがはっきり写っている。20Sept2005($\lambda=292^\circ\text{Ls}$) $\omega=346^\circ\text{W}$ では、細いデウテロニルス、21Sept2005 ($\lambda=292^\circ\text{Ls}$) $\omega=326^\circ\text{W}$ では、北極雲の縁にイスメニウス・ラクスとデウテロニルス、23Sept2005 ($\lambda=293^\circ\text{Ls}$) $\omega=302^\circ\text{W}$ ではホイヘンス・クレータ、ヘラス内部等が好く描写されている(CMO#310 p0203)。

14Oct2005($\lambda=306^\circ\text{Ls}$) $\omega=134^\circ\text{W}$ ではオリュムプス・モンス、タルシス・モンテスなど地形の陰影の描写が良く出ている。青色光では W 型雲 (CMO#311 p0218-0219)。19Oct2005 ($\lambda=309^\circ\text{Ls}$) $\omega=068^\circ\text{W}$ では黄雲発生翌日、エオスからアガトダエモン(マリネリウス溪谷)に沿って線状に伸びる黄雲の描写が綺麗である。ニロケラス上の暗部(Fons)が細かく分解。青色光では南半球朝縁と黄雲付近の明るさ。別に 057°W 、 059°W 、 061°W と同質の黄雲画像を並べる。夕縁赤道付近に夕靄(CMO#312p0246)。27Oct 2005($\lambda=314^\circ\text{Ls}$) $\omega=360^\circ\text{W}$ では広がっている黄雲の様子。クリュセからマルガリティフェル・シヌス付近が覆われている。アルギュレからノアキス南部に黄雲の帯。デウカリオニス・レギオも侵されていて、シヌス・サバエウスの濃度が目立つ。北極雲はマレ・アキダリウム北東部に明るさのコア、デウテロニルスの北側に沿っても明るい。WFI 氏のは LRGB で北極雲はこちらの方が描写がよい。但し青

画像は明るく処理してあり、濃淡模様が見えて判断を狂わせる(CMO#311p0255)。30Oct2005($\lambda=315^\circ\text{Ls}$) $\omega=277^\circ\text{W}$ では黄雲がメリディアニ・シヌスを隠している様子を朝方早く捉えている。シュルティス・マイヨル内部など、暗色模様の微細が判る。小さくなった極冠。青画像の処理は明るい(CMO#311p0256)。31Oct2005($\lambda=316^\circ\text{Ls}$) $\omega=275^\circ\text{W}$ は解像度のよい画像だが、シヌス・メリディアニは朝方の縁で黄雲の描写はない。うっかりするとこの像はキレが好いように見えるかもしれないが、AFr氏の $\omega=278^\circ\text{W}$ の画像の方が全体の浮遊黄雲を描いて優れているに注意する。RRGBだから北極雲は薄平たく見える。Bでは大きい。縁にウトピア、ボレオシュルティス、ノドゥス・アルキュオニウスも捉えられている(CMO#311p0257)。

8Nov2005($\lambda=320^\circ\text{Ls}$) $\omega=198^\circ\text{W}$ では衝効果でオリュムプス・モンスが夕縁で明斑。エリュシウム・モンズも午前側で輝く(CMO#313、p0278)。タルシス・モンテス辺りの夕縁での暗部が出ているのは重要で、既にこの像を紹介している。青色光像でも暗い(CMO#321 "CMO 2005 Mars Note (4)" p0426 右欄)。26Nov2005($\lambda=330^\circ\text{Ls}$) $\omega=025^\circ\text{W}$ ではマレ・アキダリウム上の北極雲。アルギュレから朝方に伸びる明帯。(CMO#314 p0298)

7Dec2005($\lambda=336^\circ\text{Ls}$) $\omega=284^\circ\text{W}$ にはごく小さな残留極冠が見える(CMO#314p0300)。濃淡の描写はよい。ヘッレスポントゥスを横断する朝靄の淡い明帯がある。

(CMO#314p0299)22Dec2005($\lambda=344^\circ\text{Ls}$) $\omega=127^\circ\text{W}$ では衝効果の見られなくなったオリュムプス・モンズが辛うじて見えるか。タルシスは夕方で明るい、視直径が落ちて以前ほどの描写はない。南半球朝縁高緯度に朝靄のコア。(CMO#315 p0321)。28Dec2005($\lambda=347^\circ\text{Ls}$) $\omega=053^\circ\text{W}$ は処理がきつい。マレ・アキダリウムにかかる北極雲。朝方では盛り上がり、 40°N 付近まで達している。デプレッション・ヘッレスポンティカエが脱凝縮でワイン色に濃い。アルギュレ辺りに薄明るさ。(CMO#315 p0321)

最後に1 Feb 2006 ($\lambda=005^\circ\text{Ls}$) $\omega=117^\circ\text{W}$ は $\delta = 8.8''$ 。アルバ・パテラ辺りに明斑、北極雲とは離れて見える。R光でも明るい。(CMO#316 p0341)。

♂.....On 1 Sept 2005 ($\lambda=280^\circ\text{Ls}$, $\iota=42^\circ$) at $\omega=172^\circ\text{W}$, 2 Sept 2005 ($\lambda=281^\circ\text{Ls}$) at $\omega=165^\circ\text{W}$, and on 03 Sept 2005 ($\lambda=281^\circ\text{Ls}$) at $\omega=155^\circ\text{W}$, his images all show Valhalla (noted in CMO #309 p0175). At the evening side. The Arsia cloud and the shadow of Olympus Mons are shown. Propontis I is seen split to two dark spots. The image on 1 Sept show Elysium Mons as a bright spot in the morning. The B image on 9 Sept 2005 ($\lambda=285^\circ\text{Ls}$) at $\omega=095^\circ\text{W}$ proves a small Arsia cloud. Maybe at around 13h LMT (refer to CMO #309 p0173). The small spc shows a rift (CMO #309 p0173). On 13 Sept 2005 ($\lambda=287^\circ\text{Ls}$) at $\omega=050^\circ\text{W}$, the images shows well the nph to the north of Tempe (CMO #309 p0175). Low associated an enlarged part: looked composed small patches and slits. The images on 18 Sept 2005 ($\lambda=290^\circ\text{Ls}$) at $\omega=014^\circ\text{W}$ shows well the Dawes slit over M Acidalium (refer to CMO#310 p0200). Hydaspes is clearly visible. The images on 20 Sept 2005 ($\lambda=292^\circ\text{Ls}$) at $\omega=346^\circ\text{W}$ shows a fine Deuteronilus, the ones on 21 Sept 2005 ($\lambda=292^\circ\text{Ls}$) at $\omega=326^\circ\text{W}$ show Ismenius L and Deuteronilus to the south of the nph, and the one on 23 Sept 2005 ($\lambda=293^\circ\text{Ls}$) at $\omega=302^\circ\text{W}$ show well the Huygens crater and the inside of Hellas (cf also CMO #310 p0201).

On 14 Oct 2005 ($\lambda=306^\circ\text{Ls}$) at $\omega=134^\circ\text{W}$, the complex ground network around Olympus Mons and Tharsis Montes is well shot. on the B image, the W shaped cloud is obvious (should put in CMO #311 p0216-0217). The images on 19 Oct 2005 ($\lambda=309^\circ\text{Ls}$) at $\omega=057^\circ\text{W}$, 059°W , 061°W , 068°W are all excellent in the description of the second-day fine dusts at Eos to Agathodaemon. Nilokeras is also detailed. In B (392nm~508nm) of $\omega=061^\circ\text{W}$, the dust, though near the evening terminator, looks thick with water vapour. There is also seen a morning condensate on the southern hemisphere. All seems to show an evening mist along the equatorial band (to be included in CMO #312 p0245). On 27 Oct 2005 ($\lambda=314^\circ\text{Ls}$) at $\omega=360^\circ\text{W}$, the dust looks quite expanded. The large area from Chryse to Margaritifer S is really dusty. And at the high southern hemisphere, a conspicuous dust belt is seen from Argyre to the south to Noachis. S Sabaeus is quite dense. The nph has a core at the north eastern part of M Acidalium, and

also bright along Deuteronilus (more evident than in FLANAGAN (*WFI*)'s LRGB). (CMO#311 p0254 and #323). The images on 30 Oct 2005 ($\lambda=315^\circ\text{Ls}$) at $\omega=277^\circ\text{W}$ shows the instant when S Meridiani emerges from the limb, already covered by a dust. The inside area of Syrtis Mj is detailed but too dark. The B image looks like showing waves of longer wavelengths. Clearly seen the small spc. (CMO #311 p0256). The images on 31 Oct 2005 ($\lambda=316^\circ\text{Ls}$) at $\omega=275^\circ\text{W}$ also looks to have been too enhanced, though resolution is good. Compare with the air-borne dusty image by FRIEDMAN (*AFr*) at $\omega=278^\circ\text{W}$. The RRGB image also makes the nph as if shrunk. Utopia, Boreosyrtis, and Nodus Alcyonius are well shot (CMO#311 p0256).

Olympus Mons appears bright on 8 Nov 2005 ($\lambda=320^\circ\text{Ls}$) at $\omega=198^\circ\text{W}$ because of the opposition effect. It's near the evening limb and looks like protruding. Elysium Mons is also bright at the morning side (CMO #313 p0275). Notable is the conspicuous dark segment at the limb around Tharsis Montes, as to which we already used this image in "CMO 2005 Mars Note (4)" in CMO #321 p0421.

The images on 26 Nov 2005 ($\lambda=330^\circ\text{Ls}$) at $\omega=025^\circ\text{W}$ shows interestingly the nph over M Acidalium. In B, a light streak from Argyre to the morning terminator is visible. (CMO #314 p0294~0295.)

On 7 Dec 2005 ($\lambda=336^\circ\text{Ls}$, $\delta=15.9''$) at $\omega=284^\circ\text{W}$, the small spc is still visible (CMO #314 p0300 p0296). A faint light belt of morning mist crosses Hellespontus.(should be put in CMO #314 p0296). The images on 22 Dec 2005 ($\lambda=344^\circ\text{Ls}$) at $\omega=127^\circ\text{W}$ may show Olympus Mons, but no opposition effect. Tharsis looks light near the limb. A morning mist core at the high southern latitudes. (CMO #315 p0318.) The image on 28 Dec 2005 ($\lambda=347^\circ\text{Ls}$) at $\omega=053^\circ\text{W}$ looks to have been too enhanced. Interesting is the nph around M Acidalium which rises up to 40°N . Hellesponticae Depressiones is wine-coloured near the evening limb. (CMO #315 p0318.)

The final images on 1 Feb 2006 ($\lambda=005^\circ\text{Ls}$) at $\omega=117^\circ\text{W}$ are excellent while $\delta=8.8''$. A lighter area near Alba Patera, looking separated from the nph; light also in R (CMO #316 p0339).

村上昌己・南政次 M MURAKAMI & M MINAMI

便り

Letters to the Editor

●.....Date: Mon, 25 Sept 2006 20:18:51 +0100

Subject: Some Solar stuff 23rd 24th

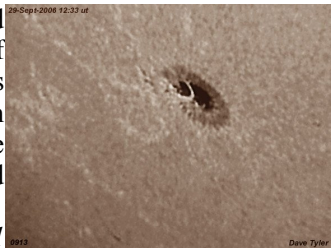
Hi Guys, Here's a first attempt at a prominence dual exposure. the disc and prominence were taken in one long paused and adjusted sequence file with the Lumenera.

Also 9010 was snapped again (I bet youll be glad when it's gone!) The changes are very noticable over the 4 hour time gap. Best wishes

○.....Date: Fri, 29 Sept 2006 23:51:49 +0100

Subject: NEW SPOTS

Hi Guys, A lucky cloud break allowed a couple of images of the "new" spots today. Seeing was poor in the constant wake of the clouds. 6 inch @f15 and f48. Best wishes



○.....Date: Sun, 1

Oct 2006 00:12:41 +0100

Subject: 0915 this morning

Hi Guys, Lucky to catch the sun today and lucky to get a young spot group that was going off the disc. 6 inch f15 achromat & Herschel wedge. Best wishes

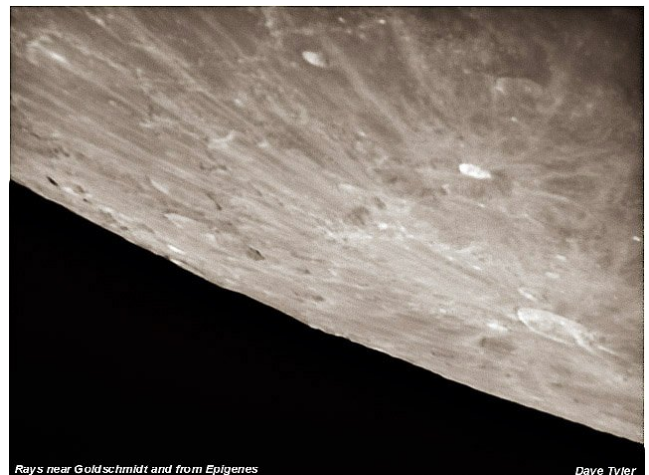
○.....Date: Tue, 10 Oct 2006 10:39:15 +0100

Subject: Lunar limb features 7th Oct

Hi Guys, I think there is something spooky about the craters near the limb seen against the rich blackness.

I took these with my old 6 inch F15 Achro, which is still on the mount for solar, visible light imaging off a Herschel wedge.....

Lunar images @ f37 from a 2.5 powermate, Lumenera 075, Trutek type 2 red filter. Seeing quite good.



Best wishes

○.....Date: Sun, 15 Oct 2006 12:38:41 +0100

Subject: Theo

Hi guys here is a lunar image from the 12th. The Moon was very high for us at 65 degrees. Best wishes

○.....Date: Sun, 15 Oct 2006 15:30:21 +0100
Subject: Moon & Saturn 14th Oct

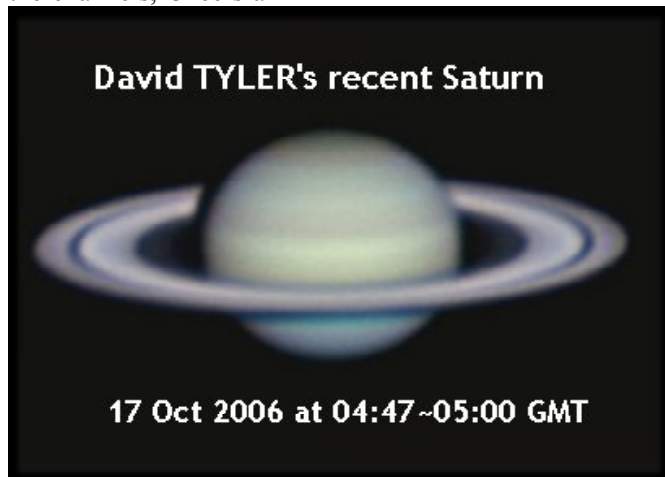
Hi Guys, Here are some images from the small hours of the 14th. Seeing was good enough for enough good frames, to give a satisfying image at the Lunar altitude of 60 degrees. But Saturn at 43deg' and needing a lot more frames, did not fair so well, but it's still pretty.

Clavscap, what a fantastic part of the Moon!

Best wishes

○.....Date: Tue, 17 Oct 2006 21:15:21 +0100
Subject: saturn 17th

Hi Guys, Bit of a misty morning and getting worse till obscurity at about 0515 ut. No spots were seen on any of the channels, Cheers all



○.....Date: Sun, 22 Oct 2006 17:58:15 +0100
Subject: Saturn 22 oct UK

Hi Guys, Was it worth it one asks? Yes of course!

After 2 hrs in a 9C windswept dome, losing body heat faster than my 2 to 3 layers could keep it in, with the seeing as bad as it gets, I was glad when the clouds decided I had had enough. This is the meagre result of one more step up the learning curve. No spots, storms or any other phenomena were recorded in any of the channels, by my Lumenera 075M, C14 and Trutek filters. Best wishes

○.....Date: Tue, 24 Oct 2006 14:40:44 +0100
Subject: Sun 24th Oct UK

Hi Guys, Just lucky to catch this group for the first time after seemingly endless rain. Best wishes

Dave TYLER (デヴィッド・タイラー Bkh UK 英)

<http://www.david-tyler.com/>

●.....Date: Tue, 26 Sept 2006 21:26:38 -0400
Subject: RE: CMO#323

Hello Masami: Thank you for sending me the latest CMO. Keep up the excellent work.

Richard SCHMUDE Jr (リーチャード・シュマット GA 美)

●.....Date: Wednesday, 27 Sept 2006 5:09 PM
Subject: 6th Annual Meeting of Lowell Society of Japan

日本ローエル協会第6回大会は、以下のように開催される予定です。

11月11日(土) 国際キリスト教大学(東京都三鷹市、JR中央線武蔵境よりバスあり)

12:00-13:00 運営委員会

13:00-14:00 総会

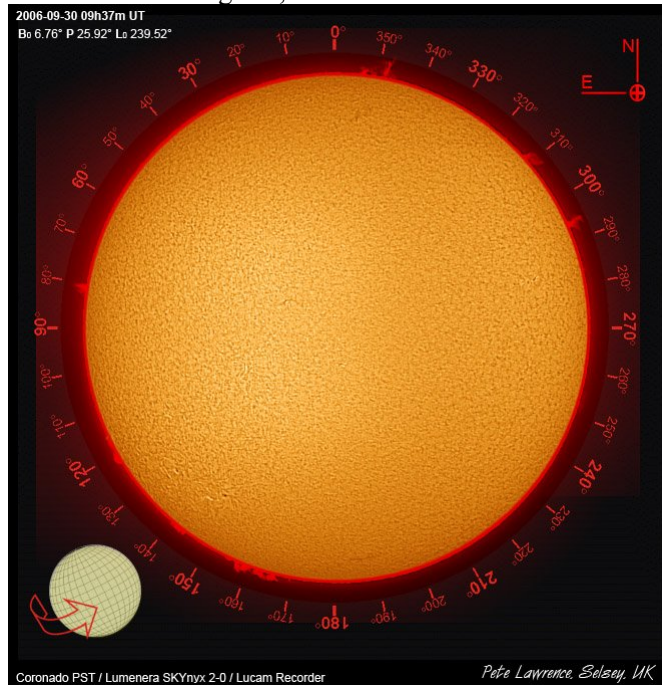
14:00-15:30 木下宙先生(国立天文台名誉教授)による講演会「ローエルと冥王星」(ローエルの計算した超海王星Planet Xと冥王星の話)

詳細は、後日、別途お知らせ致します。

平岡 厚 (A HIRAOKA 日本ローエル協会事務局)

●.....Date: Sat, 30 Sept 2006 14:06:49 +0100
Subject: Solar activity 2006-09-30

There's quite a lot of interesting prominence activity on the Sun today which is worth a look if you get the chance... Best regards,



○.....Date: Mon, 9 Oct 2006 08:34:01 +0100
Subject: C/2006 M4 (Swan) 2006-10-04

Hi all, Bright gradients, cloud and moonlight have proved a little challenging for this low evening (or morning!) comet. Here's an early wide field shot taken on the 4th. This is a single image. I have a number of shots to stack but lack of time has prevented processing to date. Best regards,

○.....Date: Wed, 11 Oct 2006 11:24:58 +0100
Subject: Large prom alert 2006-10-11 10h20m UT

A large prom is currently visible at around PA 180 degrees (if I've compensated for the Lumenera 180 degree flip and the PST 180 degree flip correctly!).

Unfortunately, at the moment, I'm rather cloud challenged but those with clear skies should take any opportunity to take a look.

○.....Date: Sun, 15 Oct 2006 20:27:20 +0100
Subject: Copernicus and Eratosthenes

Hi all, Another image from the good (UK) seeing morning of Oct 14th 2006, showing the Copernicus/ Eratosthenes region. Best regards,

Pete LAWRENCE (ピート・ローレンス Selsey 英)

<http://www.digitalsky.org.uk>

●.....Date: Mon, 02 Oct 2006 14:38:59 +0200
Subject: My new web site

Hi all, I'm pleased to invite you in my new personal Photo Gallery! This replaces my old paololazzarotti.com one. This web site was completely done by myself, at the present you can find there a narrow selection of my images but I'm still working around the database containing my whole production which is not that small! This will take a couple of weeks. Hope this is meeting your tastes! Thank you for your attention.

<http://www.lazzarotti-hires.com>

○.....Date: Sun, 15 Oct 2006 12:36:51 +0200
Subject: Re: A photometric test of blue filters

Hi Christophe, Nice to hear again from you! Hope your transition between the 2 scopes could come to an end as soon. As you know, I'm very interested in learning how a drilled mirror can work.

Regarding your study, I find it very good! Thank you for sharing such an important analysis with us! I've two things to add on:

1. Your measurements should be considered as indicative because there's no filter made by the same brand which can exactly match the same response curve of yours' ones. You should have kept into account a certain "sigma variance" in your study due to this. For example, I'm aware Astronomik is producing narrowband Halpha filters having the central peak shifted some time leftward and some time rightward respect to the Halpha line. Maybe longpass filters such these ones are less suffering with this, but your photometrical measurements should be very accurated and, as such, valid with your filters only.

2. You haven't considered the Schott BG12 filter which is a very good alternative to the W47. This Schott filter has a built-in IR block, so there's no need of using more glass to block the IR radiation. I always used this filter with my Venus imaging and I found it better than W47+BG38 solution. The Schott BG38 filter is also a valid IR blocker which was also excluded by your analysis. It's a pity. Find attached the response curve with the 2 filters. The BG12's 2% IR leakage is quite negligible because CCDs are a little more sensitive at 400 than 750nm. Hope you could consider as well these 2 filters which I consider very good for our purposes.

Thank you again for your analysis, I much appreciated!! Don't miss to advise me in case of updates and new analysis from you!

○.....Date: Sun, 15 Oct 2006 19:56:27 +0200
Subject: Re: A photometric test of blue filters

Hi Chris, Thank you for your reply! I think at the end we can get some deep result about filters now available in the market. We just know very little about these. Yes,

TEN YEARS AGO (134)

---CMO #180 (25 October 1996) pp1919-1934---

巻頭の"OAA Mars Section"は1996年接近の第二回目となり、観測者は国内六名、国外三名がリストアップされている。季節は024°Lsまで、視直径は5秒角ほどになっていた。足羽山での小懇談会時の早朝の合同観測が含まれる。18SeptにはHSTが火星の撮影をしていて、同時観測が呼びかけられた。HSTが北極冠内に黄塵を捉えて話題になった時である。その後の15Octの画像と共に以下のURLで見ることができる。

<http://hubblesite.org/newscenter/newsdesk/archive/releases/1996/34/>

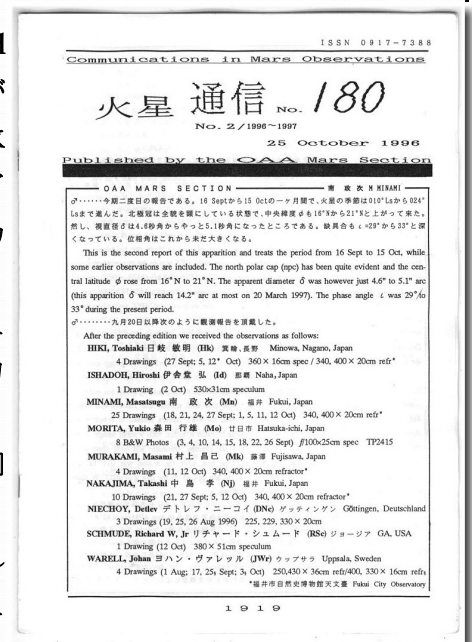
LtEは Detlev NIECHOY (Germany)、Goivanni Di GIOVANNI (Italy)、Jim BELL (USA)、Wolfgang MEYER (Germany)、Johan WARELL (Sweden)、Giovanni QUARRA (Italy)、Recharad McKIM (UK)、Richard SCHMUDE Jr (USA)、Francis OGER (France)の各氏からの来信が紹介されている。国内からは、阿久津富夫氏、森田行雄氏、日岐敏明氏、伊舎堂弘氏、永井靖二氏、宮崎勲氏のものがある。阿久津・宮崎両氏撮影の、当時活動していた土星の白斑と続く擾乱の画像が掲載されている。

Jim BELL氏からのメールには、HSTの8, 9, 15 Oct 1996の火星撮影スケジュールが速報されたニュースレターが添付されていた。森田行雄氏からは、冷却 CCD カメラ購入の第一報がある。

「福井便り」「藤沢便り」として、フランスのオジェ氏が初めて『火星通信』とコンタクトをとって福井を訪ねてきたときのことが、詳しく述べられている。十月12日には、日岐敏明氏も来福して、小懇談会が足羽山で開かれた。このときは夕方の木星、夜半に土星、明け方に、火星・金星・水星と五大惑星を全員で全部ながめた珍しい機会であった。

"CMO CLICKS"は二回目で、QUARRA氏の日本語紹介がCMO Web Pageに掲載されていることがアナウンスされた。また、"Mars Today"というWeb Pageの紹介、HSTの火星撮影日のDPK氏の画像が掲載された"MarsWatch"のWeb Pageの紹介もある。

十一月の天象とTenYearsAgo(10)も掲載されている。TYA(10)はCMO#018(10Oct1986)、CMO#019(25 Oct1986)の二号分の紹介である。二十年前当時の火星は「東矩」間近で、日没直後に南中していた。臺北の南氏は、9月末には台風の影響もなくなり、連日観測をされていたとのことである。各氏からの最接近前後の追加報告も多数寄せられていた。



村上昌己 (Mk)

I still carry any kind of filter. Later on this next week I'll update my website.

Paolo LAZZAROTTI (ハ°オロ・ラッサ°ロツティ Massa 義)
<http://www.lazzarotti-optics.com>

●.....Date: **Fri, 06 Oct 2006 15:09:54 +0900**
Subject: 『火星通信』 拝受

10月2日発の『火星通信』#323、昨日(5日)14時30分ごろ届きました。いつも、有り難うございます。

天文学会の残務整理に追われております。

○.....Date: **Tue, 17 Oct 2006 11:15:19 +0900**
Subject: **Re: FW:Re: Mars etc**

Natureの論文は8月17日号に載った、

1) Yves Langevin et al. *No signature of clear CO₂ ice from the 'cryptic' regions in Mars' south seasonal polar cap.*

2) H H Kieffer et al. *CO₂ jets by sublimation beneath translucent slab ice in Mars' seasonal south polar ice cap* の二本だと思えます。コピーをとりましたので、明日お送りいたします。

○.....Date: **Tue, 17 Oct 2006 16:53:16 +0900**
Subject: **Re: FW:Re: Mars etc**

論文のコピー、まだ郵便局が開いていましたので、先ほどお送りしました。私の論文*の別刷りを三部同封しました。ご笑覧ください。中島さんや西田さんにもお渡しいただければと思います。

* T ASADA and I MIYAZAKI "Oscillating Motion of the Jovian Great Red Spot and Numerical Experiments with IG Equation" *Earth Planets Space*, **58** (2006) 905.

○.....Date: **Thu, 19 Oct 2006 17:20:45 +0900**
Subject: **Re: 論文 拝受**

>本日、貴君の論文三部と Nature のコピー到着しました。有り難うございます。実は明日阿久津さんと山中温泉で会うことになっています。
>中島氏も西田氏も来ますので、論文はこの三方に渡します。私の分は
>今度名古屋の時にでも。村上さんの分もください。

承知しました。お持ちします。

>なかなか好い印刷で、原稿はテフカラテフですか? 英語も好くて
>きているようで、xxの英語の1000倍も好いかな。

そうです。原稿はLaTeXで書きました。英語は滅茶苦茶で、直してもらってやっとなの程度です。

>PS:里村さんから返事ありましたか、無いようなら、やはり小郷原氏
>に書きましょかね。

里村さんからはまだ返事はありません。私はもう少し待ってみようと思いますが、南さんの方から小郷原氏にメールして頂けると助かります。

○.....Date: **Mon, 23 Oct 2006 16:20:13 +0900**
Subject: **Re: [Fwd: Re: 名古屋の学会で**

南さんがいらっしゃらない場合は私だけでは時間が持てそうもありませんので、やはり夕方新幹線に京都まで一緒に乗って、その車中でお話しするぐらいで丁度いいかもしれません。『火星通信』の最近三号ぐらいをお渡しして、読んでもらうようお願いし、私のほうはGCMについて少し伺ってみたいと思います。それ以外に何か訊いてほしいことがありますら、ご連絡ください。

福井一名古屋は何時間かかりますか? 27日の火星のセッションは15時過ぎからだと思えますので、もし間に合えばお越しください。但し、どうぞ無理をされないように。

浅田 正 (Tadashi ASADA 宗像 Fukuoka)

●.....Date: **Sat, 7 Oct 2006 16:11:06 -0500**
Subject: **Re: RE:note of tribute to**

Dear Masatsugu,I would willingly, even eagerly, meet up with you and the members of the CMO at Lowell in 2008/2009 as we had hoped to do.....

Kind regards, ever,

○.....Date: **Sun, 8 Oct 2006 18:26:20 -0500**
Subject: **Re: RE:Re: RE:note of tribute to**

Dear Masatsugu, Many thanks for the photographs -- especially thanks for the fine one with Tony Misch standing next to the great lens.

Tony is off to Yale to look for evidences of David Peck Todd's involvement with the Lowell Expedition to the Andes whose centennial we celebrate next year -- we are working up an article for *Sky & Telescope*.....

And finally -- I am hoping you will comment on the Mars chapter of my Planets book in due course.

With best wishes,

P.S. I have recently received an article -- quite interesting -- from Kyong Chol Chou of the Korean Space and Environmental Science Research Institute in Seoul about Percival Lowell's diplomatic mission between the U.S. and Korea in 1883. In Korea, however, Lowell seems to have left fewer traces of his presence than in Japan. Perhaps we might visit someday and recover the lost world of Choson.

○.....Date: **Thu, 12 Oct 2006 18:08:08 -0500**
Subject: **cmo 323**

Dear Masatsugu, CMO no. 323 has just arrived -- the article "*De-concentration of the morning mist over M Serpentis*," is wonderfully erudite, as you and you only are capable of producing; a fascinating discussion, and extremely valuable and insightful. You have the ability to take the observational data and wring from them the most profound results. No one knows Martian meteorology better.

I wish that you would consider writing a book summarizing your experience of Mars observations--a collection of your experiences and the most interesting results. I would be glad to help put it into idiomatic English. We need from Minami-san the same kind of book that Lowell and Antoniadi and Maggini and Saheki produced in their time. Please consider. The Japanese contributions to Martian studies are remarkably important and too little known over here. Regards,

Bill SHEEHAN (ウィリアム・シーハン MN 美)

●.....Date: **Mon, 9 Oct 2006 00:21:58 +0100**
Subject: **Comet Swan**

Here is a shot of Comet Swan taken tonight through a lot of haze and moonlight. The faint tail extends to the left. The coloured dots are, of course, star images separated by the rapid movement of the comet between separate L, R, G and B exposures.

○.....Date: **Sun, 15 Oct 2006 16:24:24 +0100**
Subject: **Eratosthenes**

I had good seeing on the morning of the 14th (thanks Damian for the prediction) before the Moon disappeared in fog while this image was being taken. Shows part of the fascinating splatter of debris around Copernicus.

David ARDITTI (デヴィッド・アーティ Edgware ME 英)
<http://www.davidarditti.co.uk/observatory.html>

●.....Date: **Tue, 10 Oct 2006 17:49:29 EDT**
Subject: **Mars etc**

Dear Masatsugu: Thank you for describing my visual Mars work in the current CMO Bulletin. It was fine to have uploaded the drawings to your website. I wish I had time to post more of this work to the Marswatch site, but other activities for the BAA always take priority.

I am finally writing about your personal Mars work for 2001-3-5.

I am still interested in measuring drawings for the size of the SPC. In 2001, due to temporarily unfavourable tilt, there was a period near the start of the encircling storm where the number of useful drawings was considerably lower than either earlier or later. Anything you can supply at that epoch will be of value. I will also be very glad to have drawings from your side at the commencement of the storm, any that show the volcanoes during the storm as dark patches, and any remarks concerning the clearing of the event. Also any drawings made a long time before or after opposition, and of course any colour notes you care to send. The other thing that will be interesting for 2001 would be to send a set of pre-storm drawings that are close in CML to those of yours published in the BAA 1986 report, the first year that we ever collaborated.

With regard to 2003 and 2005, much the same considerations. Any drawings you feel especially significant with regard to the onset of particular phenomena such as storms, polar rifts, ECB, etc., and again for 2003 any really detailed drawings that could easily be compared with the ones of yours published in the BAA Journal from 1988.

I will be happy to receive as many xerox copies as you care to make, but if you prefer to send jpegs that will be fine too.

There are three more papers of mine accepted and now awaiting space in the Journal: one dealing with the Ashen Light of Venus based upon 100 years of observations by Henry McEwen and Patrick Moore, an account of the 2004 Venus elongations and transit, and a final Mars report for 1999. With best wishes

○.....Date: Sat, 14 Oct 2006 17:20:24 EDT
Subject: Re: Mars etc

Dear Masatsugu, My thanks for setting out your plans to make and send jpegs of the 2001 Mars drawings. I look forward to these at your leisure. I will now be away for two weeks, by the way.

Preliminary analysis of BAA and HST data suggested a delay in the recession of the SPC in the period as the storm was abating, but more data will be needed to confirm or deny this.

The piece of news about 'explosive' venting of carbon dioxide causing sand and dust to spray over the SPC in southern spring, as cited in *Nature* in August and in the current issue of *Sky & Telescope* is especially interesting. This appears to account for the temporary darkening of the cap at this time, as witnessed many times by ground-based observers. I had assumed the phenomenon was simply polar dust activity, but the authors of the *Nature* paper have given the above mechanism. This is yet another incentive to carry on the ground-based work.

With best wishes

Richard McKIM (理查·麥肯 Peterborough 英)
Director, the BAA Mars Section
<http://www.britastro.org/mars/>

●.....Date: Wed, 11 Oct 2006 01:22:31 EDT
Subject: C/2006 M4 (Swan) October 9, 2006

Hi all - Some nice photos here of Comet Swan! I thought I share my images of Comet Swan right after sunset from New York on Oct.9th between 23:20 UT and 23:50 UT. Not great but some decent shots. See here: <http://hometown.aol.com/frankj12/cometsindex.htm>

The comet was just 15 degrees above the NW horizon. First I imaged with a 200mm telephoto lens taken with a Starlight Xpress MX-5. Note some trees on the right side

of the image. Then I've attached the camera onto a ten-inch Meade LX200. The last image on the webpage you will see the contour of the inner coma. There is a little spike pointing north direction from the nucleus.

Frank J MELILLO (フランク・メリッロ Holtsville, NY 美)

●.....Date: Sat, 14 Oct 2006 21:31:55 +0200
Subject: A photometric test of blue filters

Dear all, My mewlon 210 has been sold and the future 10" is still not there (should arrive this month), and we're in a period of low "planet activity". I thus present you a little study of a different kind, it might not appear interesting to everyone, but this is my first achieved photometric work. The prime idea was to find which filter is best to block the IR leak of the W47 violet filter without losing too much UV light. It gave some interesting results and I think that I will repeat the experience in the future. The page is at :

<http://astrosurf.com/pellier/testofbluefilters>

While the use of a spectrophotometer is preferable to give more readable data, photometry has the advantage of giving results under real conditions, on real sky objects. By the way, I have been working on a complete re-designing of my CCD filter pages. The work is not over yet but you'll find it at :

<http://astrosurf.com/pellier/filters>

Best wishes

PS thanks for all your images of Sun, Moon, Uranus... and welcome to first Saturn's !

○.....Date: Sat, 14 Oct 2006 21:48:13 +0200
Subject: Re: May we ask a favour of you?

Dear Masatsugu, This is my turn to be sorry for answering late. I had wrote to you a answer soon after your message, but as I was about to send it to you, I made a computer mistake that closed Windows !! It discouraged me to write it again and I've been lazy on the following days. I'm going now to attack a note for you. I was absolutely willing before that to end the update of my filter pages that you've just received. Sometimes I must force myself to end the things I begin - a kind of discipline... I do not write everything I would like, updating a website is a heavy work, but you already know that.

My telescope is still getting constructed. You can go and see it on this page :

<http://www.astrotelescope.com/cassegrain250.html>

Best wishes

○.....Date: Sun, 15 Oct 2006 14:30:14 +0200
Subject: Re: A photometric test of blue filters

Hi Paolo,

- > 1. Your measurements should be considered as indicative because there's
- > no filter made by the same brand which can exactly match the same
- > response curve of yours' ones. You should have kept into account a
- > certain "sigma variance" in your study due to this. For example, I'm
- > aware Astronomik is producing narrowband Halpha filters having the
- > central peak shifted some time leftward and some time rightward respect
- > to the Halpha line. Maybe longpass filters such these ones are less
- > suffering with this, but your photometrical measurements should be very
- > accurated and, as such, valid with your filters only.

Yes, definitely ! Those measurements should not be taken at a very precise level. Not to talk about possible variations of passbands for a same filter, some other things might marginally flaw the results, such as seeing (seeing was less good on the second night) . It's only an indication of classification, but by the way maybe the Bu filter is slightly more UV transparent in reality than the L filter. One source of error I did not consider at the time is

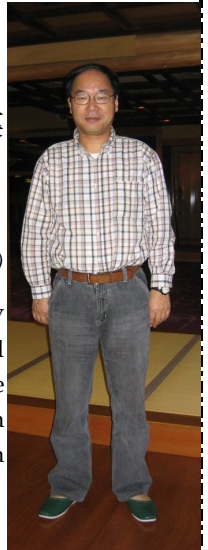
the presence of a residual IR leak in the transmission of



★阿久津富夫氏来たる : どうもこの頁はヘンな頁になってしまい、阿久津氏だらけになってシマツタが、何か写真の阿久津さんはいつも眠っている様な眼をしているから(一枚はまるで寝ている様なものがある)、ここでは立っている姿も證據に入れた。阿久津さんが山中温泉に寄るといので、十月 20 日 CMOFukui は出掛けて行き、彼の旅館のロビーで暫し楽しい久しぶりのチャットの時間を持った譯である。★山中は芭蕉が「北海の磯づたひして、加州山中の涌き湯に浴ス」と前書きし「山中や菊は手折らじ湯のほひ」と詠んだ處で(『奥の細道』では「手折らぬ」)、その湯を好く褒めている。筆者は次頁の長さんの案内通りに一向一揆歴史館や「唐變木」で蕎麦を食べて出掛けたが、未だ阿久津氏の宴會の果てるのを待つ間、露天風呂に入った。まことに「皮肉うるほひ」「顔色とどむる」心地であった。實は山中



は山一つ隔てるが Ns 氏の金津のホンの裏である。★阿久津氏はセブ疲れもなく元氣であった。ホテルからの火星は駄目だが、セブの空は倍率 1000× でも揺れがない由。新 Web カメラの話アリ。(Mn)



Tomio AKUTSU (Ak) → was visited by the CMO Fukui (Nj, Ns and Mn) when he passed by around here at Yamanaka Spa on 20 Oct. He enjoyed a short trip in Japan during a vacation from Cebu (Ak returned home on 15 Oct and on 24 Oct went again to the Cebu island.)

(← Front: Ak and Mn, back: Nj and Ns.

Nj=Takashi NAKAJIMA is a different person

from Nk=Morimasa NAKAJIMA below: Nj: b.1939, Nk: b 1938)

the UV filter, perhaps adding 5% of light. Two of the filters added are sensitive to IR (the W47 and the SP-4) so their coefficient of transmission should be lowered by 5% also... Anyway I should complete the study by further measurments, including tests on the planets themselves !

- > 2. You haven't considered the Schott BG12 filter which is a very good alternative to the W47. This Schott filter has a built-in IR block, so
- > there's no need of using more glass to block the IR radiation.
- > I always used this filter with my Venus imaging and I found it better than W47+BG38 solution. The Schott BG38 filter is also a valid IR blocker which was also excluded by your analysis. It's a pity.
- > Find attached the response curve with the 2 filters. The BG12's 2% IR
- > leakage is quite negligible because CCDs are a little more sensitive
- > at 400 than 750nm. Hope you could consider as well these 2 filters which I
- > consider very good for our purposes.

Well I would have tested them if I only I had them in my collection ! The BG12 looks different from the W47 to me. Its cutoff (50 % transmission in the descending part of the curve) looks to be located after 450 nm, while the W47 has its near 430 nm. This makes a real difference believe me for Mars ! The BG12 looks more similar to my SP470. The BG38 is a very interesting filter indeed for IR-blocking and UV-transmitting. I had it in mind already... maybe I'll consider buying one, do you have it in stock in any case ? Best

Christophe PELLIER (クルストフ・ペリエ nr Paris 法)
<http://pellier.christophe.club.fr/index.htm>

●.....Date: Mon, 16 Oct 2006 20:55:30 +0900
 Subject: Re: 20 日のこと

こんばんわ阿久津です。既に日本へ戻っています。日本は良いですね。

さて社内旅行ですが 19 日は和倉温泉、20 日は山中温泉(よしのや依緑園)に泊まります。21 日の 11:00 - 12:30 は東尋坊で昼食だそうです。

20 日の山中温泉は 17:00 着予定です。お会いできますのは夕食後の 20h 以降になると思います。

中島守正さんの烏山の電話番号か、住所が分かりましたら教えて下さい。

○.....Date: Wed, 18 Oct 2006 08:54:02 +0900
 Subject: RE:Re: 20 日のこと

おはようございます。20 日の夜の再会を楽しみにしています。宿泊名は「株シオダ」です。よろしく願います。

○.....Date: Mon, 23 Oct 2006 00:28:47 +0900
 Subject: ありがとうございます。

先日の山中温泉での再会は楽しいひと時でした。ありがとうございました。21 日には予定変更し、永平寺に行きました。

さて 22 日、横浜から移住された中島さん宅を訪問しましたので報告します。家は周りに田んぼがあり、自然が豊富でどかな環境でした。家の庭には八角形の自作のドームが在り、中には 20cmF/7.5 (星野鏡、鏡筒/自作、架台/西村製) ニュートン式反射が据付られています。空の条件は天頂付近は文句なしに良く、南側の視界が少し悪いぐらいです。今後が楽しみです。



奥様からのおみあげありがとうございました。
阿久津 富夫 (Tomio AKUTSU セブ The Philippines)

(Photo 註) Tomio AKUTSU (rhs, Ak), back for a while, visited Morimasa NAKAJIMA (lhs, Nk) who recently moved from Yokohama to Karasuyam, Ak's home town. The octagon dome is hand made by Nk, and contains a 20cm f/7.5 Newtonian. Nk is a Mars Watcher from mid-1950's.

●.....Date: Thu, 19 Oct 2006 14:13:44 +0900

Subject: Re: 阿久津さんが石川へ

南様、メールを戴いてから先程まで調整を試みたのですが、残念ながら夜は無理ですね。社員が辞めることになり次の人材と面談しなければならないのです。先方の都合と合致するのが 20 時 30 分なので分身の術でもつかわないと無理ですね。あいにく忍者修行の経験がないのでできません。残念です。

吉野谷に来られるのですか?我が家から 30 分ほどです。昨年星の会のメンバーが観測所を建てました。鳥越城は霞の上になるのですが、平地は霧や霞がでやすい場所です。隣の河内町は霧の里と呼ばれています。

阿久津さんに宜しくお伝え下さい。

○.....Date: Fri, 20 Oct 2006 02:24:43 +0900

Subject: Re: 阿久津さんが石川へ

> 吉野谷は私是不案内なのですが、江津に Gallery があって小野忠弘と
> 宗左近の縄文展示があるらしいので、観てこようと思っているので
> す。ただ、地図で見ると、山中に戻るのには遠いね(360 号線を往來する)。
> 確かに 147 号線を北に走ると野々市ですね。

360 を走るのが一番早いですね。この道は城跡が多く残っているところです。小松から涌泉寺温泉(野茂選手の隠れ湯治場)から原町を通過しますが、原町は仏御前の生まれたところです。もう少し行くと右手に看板がありますが岩倉城跡が左手の山にあります。そこを過ぎて中ノ峠になります。この峠の左右に中ノ峠城がありました。ちなみにこの山の頂は火燈山と言います。山頂からほぼ北西 45 度に観音山があります。遣水観音山と申しまして、湧き水を無病息災として汲場があります。...篝火の調査の根拠として私は利用しています。さて、中ノ峠を越えると、一向一揆の資料館が右手に見えてきます。直ぐわきにある小山が二曲(ふとげ)城跡で左手の小山が鳥越城跡です。資料館の前にある「そば屋」はなかなか旨い。有名な一揆蕎麦より数十倍良い蕎麦です。でも、もし 157 を通らずに江津に向かうのなら資料館を過ぎて橋を渡ったところの信号で左に 44 を走ります。鳥越城の入り口を通り越して走りますと、左手に一見喫茶店風の「蕎麦どころ唐変木」があります。

ここの蕎麦は、打ちものどごしも、つけ出汁も良いです。是非、ご賞味下さい。ご推薦いたします。

> 九月に大聖寺吸坂の裕伊之助美術館で、翁長剛さんのイタリア歌曲を聴いてきました。その前後に金沢の県美で信貴山縁起絵巻を観てきました。
> ただ、二十一世紀美は外観を観て敬遠しました。

いいですね。久しく歌曲は聴いていません。と、言うよりコンサートに行っていない。せいぜいケーナのコンサートぐらいですね。穴水の火星ローエル会議でオカリナを演奏して戴いた上村彰さんとは、その後もお付き合いをしています。春には私の仕事場で二曲ほど演奏してもらいました。...

二十一世紀美は私も好きになれません。完成して間もないときと、下手くそな二水会の絵を見たときの二度ばかり行きましたが。金沢県美は毎年、伝統工芸展を見に行きます。小松児童館の主任をしている長谷川哲郎君は九谷焼きの長谷川塑人さんの息子です。長谷川塑人さんのギターは上手いです。なにしろプロを目指したことがあるそうです。小沢征爾と宇野重吉を合わせた風貌です。...

Lowell のお話を作っている最中に HD のトラブルに遭い、現在データの復活に追われています。大切な荒山峠の絵図まで消えてしまいました。

長 兼 弘 (Kaneshiro OSA 野々市 Ishikawa)

●.....Sent: Sunday, October 22, 2006 4:19 AM

Subject: glorious copernicus

Hi all - A recent early snowstorm here left us without power for five days - perfect time to curl up with a laptop, big 12 volt battery and a pile of lunar data from a good night at the end of summer (which seems like it was ten years ago!):

http://www.avertedimagination.com/img_pages/glorious_copernicus.html

About 100 frames were hand selected and stacked from each of nine streams - numerous alignment points - assembled in Adobe Photoshop CS2 on a Mac.

best wishes -

Alan FRIEDMAN (アラン・フリードマン Buffalo, NY 美)

<http://www.avertedimagination.com/main1.htm>

☆ ☆ ☆

シー・エム・オー・フクイ

中 島 孝 Nj

★前回報告以降、永井 靖二様(383)よりカンパを頂戴しました。有難うございました。不一

☆ Kasei-Tsushin CMO

(Home Page: <http://www.mars.dti.ne.jp/~cmo/ISMO.html>)

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