

## MARS

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*Published by the International Society of the Mars Observers***Abandon the Patchwork of Dust Images of Different Days**

By

**Masatsugu MINAMI**

As has been suggested several times in the CMO, we have taken the view that the dust cloud on Mars continues to be stable on one day, namely it may ascend upwards, but does not move laterally: that is any dust patch does not fluctuate in contrast to the movement of the Typhoon or Hurricane on the Earth. For example we experienced this trend at full length in October 2005 [1]. Even if we date back to the past, we have not experienced that any other larger dust cloud did show further movement or shift on one day time. Of course, we know we have experienced several times the facts the dust completely changed its form and scale on the next day.

However there are people who want to regard this change or shift as the movement of the dust in question. They try to put the data of the different days side by side like a patchwork and consider that the dust cloud moved as such every day. Our CMO does not employ such a view and excluded such a work and did so even if it was written by veterans. The reason is simple. Since any dust stays still (at least about its position and form) in the whole day time, it will be impossible for it to move at night.

As a conclusion we have the view that it is in the morning and just before dawn that the dust

changes largely. This kind of change cannot be called the movement. Any dust patch appears to stay if in the next morning, we should call rather this is a new reproduction. That is, some may vanish and some are reproduced in a different form, and so this is a new form: we regard this is quite a different object from the one on the day before. Of course if the dust patch does not vanish it may be called reproduced since it has an internal potential, but this can not be called a movement. Thus if it is revived its form must be quite different. Since nobody knows the outstanding activity of the dust at night (this is impossible since we don't yet know the activity in the day time), the revived dust form in the morning must be quite different from the dust form of the preceding day. We can thus never expect probabilistically the same form of the preceding day.

Of course the matured dust storm at the late period by which the whole globe is covered by the dust clouds must be considered differently. In this case the whole globe is quite different from the usual atmospheric structure: Already white clouds cannot be seen and the activity due to the water vapour vanished [2]. Even the mountain cloud traces also the same way as we experienced at the beginning of the 21 century. In this case it will be

the same at night.

The kind of soft dust activity at the late period must gradually be changed since the dust atmosphere made of the larger dusts will receive earlier fallout on the surface and the upper atmosphere will become cleaned earlier. And thus the Martian atmosphere will gain its usual original form. Of course any complete clean-up cannot be realised and still the effect of the dust storm must be remembered by the atmosphere, and again at the dawn line another disturbance by dust may be reproduced.

The atmosphere activity of Mars is thus complex, but this is the Mars atmosphere. The meteorology of Mars is caused by nothing but the atmosphere woven by small dusts and this is the usual aspect. If we compare with the atmosphere on the Earth, the water vapour corresponds to the dusts on the atmosphere of Mars: As is the Earth full of water vapour, Mars atmosphere is full of dusts. The large difference is that the Earth's water vapour is in good harmony with the temperature of the atmosphere, and hence the water vapour does not receive so large temperature influence by the difference of night and day, while on Mars the temperature of atmosphere caused by the dusts is very different in the day and at night as if the deserts are sent to the atmosphere of Mars, and hence the Martian atmosphere is very sensitive to the temperature, so that day time potential cannot be brought to the night. This is also seen on the Earth deserts even if it is influenced by the Earth atmosphere. Thus on Mars

it cannot be thought of the movement of the dust clouds at night.

One may wonder why even then at a similar place on Mars one can check dust cloud on the next day. It must be possible if the latent ability of dust is so strong that the Martian meteorological condition pertains. Furthermore the dust may be suffered under discontinuous change.

To conclude, the difference of the atmospheric phenomenon due to the water vapour and that caused by the dust phenomenon is so large; they should not to be confused. The observation of Mars implies the investigation of such differences, and we should abandon the old fashioned primitive idea that Mars is similar to the Earth (or Jupiter).

Of course there are observed the phenomena caused by the water vapour on Mars and so these must be treated cautiously. However the difference of Mars from the Earth is quite severe in a level way, and so any easy analogy must be refrained.

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[1] As a concrete example of our thinking way, see "Miracles occurred on 18 October 2005" Mars Note (7) in CMO #324 (15 Oct 2006), where given is a typical sequence of a dust cloud of one Martian day based on the work made by several observers in several countries.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmomn3/CMO324.pdf>

[2] This was seen on the occasion when a global dust storm governed the planet surface in 2001. White cloud disappeared since the occupation by the global dust cloud occurred.

#### CMO/ISMO 2011/12 Mars Report #11

### 2011/2012 Mars Observations in May 2012

♂.....The 11<sup>th</sup> report of 2011/2012 season treats the observations made during May 2012: The planet was moving regularly to the east and at the end of May reached at the rear legs of Leo. At first it shined in the southern sky, but it began to pass the meridian gradually earlier, and finally at the sunset time it already passed the meridian. The Martian season was from  $\lambda=104^\circ\text{Ls}$  to  $118^\circ\text{Ls}$ , and the apparent diameter went down from  $\delta=10.0''$  to  $7.9''$ . The phase angle  $\iota$  augmented from  $34^\circ$  to  $39^\circ$ . The tilt still showed the northern district and at the end of May  $\phi$  reached  $25.5^\circ\text{N}$ .

♂.....During May, we received the reports as follows: From abroad we received the reports from 15 members, while domestically just 6 observers: NAKAJIMA (*Nj*) and MINAMI (*Mn*) were unfortunately

forced to retire because of illness. From Sweden we welcomed a new observer HÖGBERG (*MHg*) who was introduced by WARELL (*JWr*)

**AKUTSU, Tomio (*Ak*)** Cebu, the Philippines

2 Sets of *RGB* + 2 *IR* + 2 *LRGB Colour* Images (19, 26 May 2012)  
36cm SCT @f/55 with a DMK21AU04

**DELCROIX, Marc (*MDc*)** Tournefeuille, France

4 Sets of *RGB* + 3 *IR* + 1 *Colour* + 1 *L* Images (2, 6, 24, 28 May 2012)  
32cm speculum with a Basler acA640-100gm

**FLANAGAN, William (*WFl*)** Houston, TX, the USA

1 Set of *LRGB* Images (20 May 2012) 36cm SCT @f/27 with a Flea3

**GHOMIZADEH, Sadegh (*SGh*)** Tehran, Iran

3 *Colour* Images (7, 9, 12 May 2012) (28cm SCT with a DMK21AU04.AS)

**GRAFTON, Edward A (*EGf*)** Houston, TX, the USA

1 *Colour* Image (4 May 2012) 36cm SCT @f/39 with an ST412

**HÖGBERG, Martin (*MHg*)** Örebro, Sweden

3 Sets of *RGB* Images (6, 16, 18 May 2012) 25cm speculum, with a DBK21AU04

**ISHIBASHI, Tsutomu (*Is*)** Sagamihara, Kanagawa, Japan

2 *Colour* Images (5, 13 May 2012) 31cm speculum, with a SONY HC9 Video cam

**KONNAĪ Reiichi (*Kn*)** Ishikawa, Fukushima, Japan

9 Drawings (14, 19, 26 May 2012) 750×30cm SCT

**MELILLO, Frank J (*FMI*)** Holtsville, NY, the USA

4 *Colour* Images (7, 12, 19 May 2012) 25cm SCT with a ToUcam pro II

**MORALES RIVERA, Efrain (*EMr*)** Aguadilla, Puerto Rico

4 Sets of *LRGB* Images (2, 4, 12, 23 May 2010) 31cm SCT with a DMK21AF04

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

15 Sets of *RGB* + 15 *LRGB Colour* + 15 *L* Images (3, 5, 12, 13, 16, 18, 22, 23, 26, 28, 31 May 2012)  
25cm speculum with a Flea3

**MURAKAMI, Masami (*Mk*)** Fujisawa, Kanagawa, Japan

2 Drawings (27 May 2012) 400×20cm *F/8* speculum

**NISHITA, Akinori (*Ns*)** Awara, Fukui, Japan

1 *Colour* Image (5 May 2012) 65cm refractor\* with a DMK21AU618AS  
\*Kyoto Univ Hida Observatory, Gifu, Japan

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

1 Set of *RGB* Images (7 May 2012) 36cm SCT @f/42 with a DMK21AU618.AS

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

1 Set of *RGB* + 14 *RGB Colour* + 4 *B* Images (1, 6, 12, 13, 22, 24, 27, 28, 30 May 2012)  
(36cm SCT with a SKYnyx 2-0M)

**PELLIER, Christophe (*CPl*)** Nantes, France

1 Set of *LRGB* Images (23 May 2012) 25cm speculum @f/32 with a PLA-Mx

**POUPEAU, Jean-Jacques (*JPp*)** Essonne, France

1 Set of *RGB* Images (3 May 2012) 35cm Cassegrain @f/29 with a SKYnyx 2-0

**TYLER, David (*DTy*)** Flackwell Heath, Bucks, the UK

4 *LRGB Colour* + 4 *R* Images (1, 6, 11, 13 May 2012) 36cm SCT with a Flea3

**WARELL, Johan (JWr)** Skivarp, Sweden

11 Sets of RGB Images (2, 3, 5, 6, 13, 17, 23,~25, 28, 29 May 2012)

22cm speculum @f/27 with a DBK21AU618

**WILLEMS, Freddy (FWI)** Waipahu, Hawaii, the USA

14 Sets of RGB + 23 Colour + 1 R + 14 IR Images (2, 4, 6, 8, 11,~13, 16, 19 May 2012)

36cm SCT with a DMK21AU04.AS

♂.....**We Further Received:**

**HEATH, Alan W (Aht)** Long Eaton, Nottingham, the UK

3 Colour Drawings and Reports (30 March; 1, 5 April 2012) 200×20cm SCT

♂..... Since the diameter of the planet was being shrunk, the images made at the earlier period showed some more details. On 1 May ( $\lambda=105^\circ\text{Ls}$ ) TYLER (*DTy*) took a nice image at  $\omega=018^\circ\text{W}$ , while PEACH (*DPc*) produced similar images at  $\omega=019^\circ\text{W}$ , and at  $031^\circ\text{W}$  to be compared: Both observers show a peculiar form of the P-ring (dark fringe). *DPc's*  $\omega=031^\circ\text{W}$  is more interesting and looks to show a small dust at the root of Iaxartes. On 2 May ( $\lambda=105^\circ\text{Ls}$ ), MORALES (*EMr*) still showed clearly the poking-out of the Tharsis Trio and Olympus Mons at  $\delta=9.8''$ . There is seen a cloud between the trio and big Mons. The image by DELCROIX (*MDC*) is also good. On 3 May ( $\lambda=105^\circ\text{Ls}$ ), MORITA (*Mo*) showed up at  $\omega=224^\circ\text{W}$  a large cloud oozed out from Elysium to the morning side of the disk. POUPEAU (*JPp*) at  $\omega=360^\circ\text{W}$  checked a faint blue Syrtis Mj. On 4 May ( $\lambda=106^\circ\text{Ls}$ ) GRAFTON (*EGf*)'s image shows at  $\omega=086^\circ\text{W}$  the poked out images of Tharsis Montes. On 5 May ( $\lambda=106^\circ\text{Ls}$ ) Elysium looked cloudy on *Mo's* images. NISHITA (*Ns*)'s image taken at the Hida Observatory (65cm Zeiss Refractor) shows at  $\omega=225^\circ\text{W}$  Olympia separated from the npc (under poor seeing). In Sweden, WARELL (*JWr*) captured Hellas at  $\omega=342^\circ\text{W}$ . On 6 May ( $\lambda=107^\circ\text{Ls}$ ) HÖGBERG (*MHg*) also showed Hellas was bright at  $\omega=329^\circ\text{W}$ . On *DPc's* images at  $\omega=334^\circ\text{W}$  and  $\omega=341^\circ\text{W}$  Hellas looks clearer near the evening limb, and the npc is more detailed: Rima Borealis and Olympia are seen. On 7 May ( $\lambda=107^\circ\text{Ls}$ ), PARKER (*DPk*) described Baltia including Iaxartes at  $\omega=042^\circ\text{W}$ . On 11 May ( $\lambda=109^\circ\text{Ls}$ ), WILLEMS (*FWI*) at  $\omega=086^\circ\text{W}$  showed Tharsis Montes poked out from the morning mist. On 12 May ( $\lambda=109^\circ\text{Ls}$ ) *FWI* also described the poking out aspect partly at  $\omega=079^\circ\text{W}$ , and at the same time showed Hyperboreus L was very dark. *Mo* at  $\omega=139^\circ\text{W}$  showed the complex aspect around Olympus Mons, and on R he showed clearly Hyperboreus L and Olympia near the npc. *DPc* on the same day at  $\omega=280^\circ\text{W}$ ,  $289^\circ\text{W}$  obtained good images in which the vicinity of the npc is interesting: Olympia was detailed and Chasma Boreale is visible: These are nice images when  $\delta=9.1''$ . Hellas also looked doubled perhaps showing an inner structure of Hellas. On 13 May ( $\lambda=110^\circ\text{Ls}$ ) *FWI* again showed the poked out Montes. *Mo's*  $\omega=124^\circ\text{W}$  on the day described the complex aspect of the area near Olympus Mons. Solis L is seen near the southern district. *DTy* put forward a detailed image at  $\omega=255^\circ\text{W}$ . *DPc's* images at  $\omega=262^\circ\text{W}$ ,  $271^\circ\text{W}$  are far clearer, and excellent in describing the area of Olympia. Note the morning of Hellas. The drawing of KONNAĬ (*Kn*) on 14 May ( $\lambda=110^\circ\text{Ls}$ ) at  $\omega=110^\circ\text{W}$  shows from the remainder of M Acidalium to the morning Mountain area covered by a mist. On 16 May ( $\lambda=111^\circ\text{Ls}$ ) at  $\omega=249^\circ\text{W}$  *MDC* shot an image in which the bright Elysium is in the evening and in the morning Syrtis Mj is appearing. *MHg* also took a similar composition at  $\omega=254^\circ\text{W}$ : Syrtis Mj is bluish. On 17 May ( $\lambda=112^\circ\text{Ls}$ ) WARELL (*JWr*) produced a similar shot at  $\omega=237^\circ\text{W}$  while in B Elysium cloud is reaching the morning terminator. Each composition image is well shot similarly. On 18 May ( $\lambda=112^\circ\text{Ls}$ ), *MHg* took at  $\omega=237^\circ\text{W}$  where Phlegra is dark brownish and it seems Propontis I is visible. On 19 May ( $\lambda=113^\circ\text{Ls}$ ), *Ak* took images at  $\omega=073^\circ\text{W}$ : The morning mist was still strong and Tharsis Montes poked out. On 19 May ( $\lambda=113^\circ\text{Ls}$ ) *Kn* drew and observed the surfaces at  $\omega=060^\circ\text{W}$  and  $\omega=070^\circ\text{W}$ : M Acidalium is at the afternoon side, and the np region

including Hyperboreus L was detailed in soft touch. On 20 May ( $\lambda=113^\circ\text{Ls}$ ), Bill *WFl* also took a nice image at  $\omega=324^\circ\text{W}$ : the npr is well described with separated Olympia, and Hellas is very bright near the evening limb. He shows a small shadowy spot also on this image to the north of the SE part of S Sabaeus.  $\delta=8.6''$ . On MORALES (*EMr*)'s image on 23 May ( $\lambda=115^\circ\text{Ls}$ ) at  $\omega=221^\circ\text{W}$ , Olympia rode on the npc. Phlegra is brownish, and Olympus Mons is white at the eastern terminator. On 24 May ( $\lambda=115^\circ\text{Ls}$ ) *DPc* shows Olympus Mons interestingly at  $\omega=162^\circ\text{W}$ . *JWr* and *MDc* took at the nearly same angle where Olympia is to the south of the npc. Elysium looks slightly bright at the morning end. On 26 May ( $\lambda=116^\circ\text{Ls}$ ), *Kn* produced a sketch at  $\omega=000^\circ\text{W}$ . On the other hand *Ak* took images at  $\omega=033^\circ\text{W}$  where M Acidalium dominates: on these images *Ak* trapped a white morning cloud at the eastern Baltia following the npc. It is quite bright on G and B, and clearer on RGB than on LRGB. On 28 May ( $\lambda=117^\circ\text{Ls}$ ) *DPc* showed an excellent series of the images where the poked-out Montes are vivid with an interesting portrayal of Olympus Mons. *MDc* produced a set of images at  $\omega=137^\circ\text{W}$  where the vicinity of Olympus Mons is complex: Olympia is definite at the western side of the npc. This is also captured by *JWr* at  $\omega=139^\circ\text{W}$ . The B image on 29 May ( $\lambda=117^\circ\text{Ls}$ ) by *JWr* at  $\omega=126^\circ\text{W}$  is interesting.  $\delta=8.0''$ .

*Masami MURAKAMI & Masatsugu MINAMI*

## Letters to the Editor

●... *Subject: Mars: April 30, 2012*  
*Received; 1 May 2012 at 13:38 JST*

Hi - I have attached my latest image of Mars April 30, 2012 to be posted.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120430/FMI30Apr12.jpg>

Thanks,

○... *Subject: Mars: May 7, 2012*  
*Received; 8 May 2012 at 13:20 JST*

Hi - I have attached my latest images of Mars May 7, 2012 to be posted.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120507/FMI07May12.jpg>

Thanks,

○... *Subject: Mars: May 12, 2012*  
*Received; 14 May 2012 at 01:30 JST*

Hi - I have attached my latest image of Mars May 12, 2012 at 3:25 UT.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120512/FMI12May12.jpg>

Thanks,

○... *Subject: Mars: May 19, 2012*  
*Received; 26 May 2012 at 13:38 JST*

I have attached my latest image of Mars May 19, 2012.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120519/FMI19May12.jpg>

Thanks,

**Frank J MELILLO** (Holtsville, NY)

●... *Subject: Mars images (April 1st, 2012.)*  
*Received; 1 May 2012 at 23:11 JST*

Hi all, Some belated images from April 1st. Seeing was very good. Hellas looks brilliant with a notable weak equatorial cloud band across the disk.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120401/DPc01Apr12.jpg>  
[http://www.damianpeach.com/mars1112/2012\\_04\\_01rgb.jpg](http://www.damianpeach.com/mars1112/2012_04_01rgb.jpg)

This set makes a great comparison with an image set obtained exactly one month before in excellent seeing:

[http://www.damianpeach.com/mars1112/2012\\_03\\_01rgbs.jpg](http://www.damianpeach.com/mars1112/2012_03_01rgbs.jpg)

Note how Hellas only had a few wispy clouds over it the month before. NPC is also larger with no rift visible. Also interesting how much difference the extra 1.4" of diameter makes to the image scale and resolution. Best Wishes

○... *Subject: Mars images (April 2nd, 2012.)*  
*Received; 2 May 2012 at 03:41 JST*

Hi all, An image from the 2nd. Rather poor conditions.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120402/DPc02Apr12.jpg>  
[http://www.damianpeach.com/mars1112/2012\\_04\\_02rgb.jpg](http://www.damianpeach.com/mars1112/2012_04_02rgb.jpg)

Best Wishes

○... *Subject: Mars image (April 4th, 2012.)*  
*Received; 3 May 2012 at 06:29 JST*

Here is an image from April 4th in good seeing. Syrtis Major is prominent covered in clouds. Elysium is also bright with clouds. A weak and irregular ECB crosses the disk.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120404/DPc04Apr12.jpg>  
[http://www.damianpeach.com/mars1112/2012\\_04\\_04rgb.jpg](http://www.damianpeach.com/mars1112/2012_04_04rgb.jpg)

Best Wishes

○...**Subject: Mars image (April 5th, 2012.)**  
**Received; 4 May 2012 at 04:18 JST**

Hi all, Here is an image from the 5th in fair seeing. Similar view to the previous night though seeing wasn't quite as good.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120405/DPc05Apr12.jpg>  
[http://www.damianpeach.com/mars1112/2012\\_04\\_05rgb.jpg](http://www.damianpeach.com/mars1112/2012_04_05rgb.jpg)

Best Wishes

○...**Subject: Mars images (April 13th, 2012.)**  
**Received; 6 May 2012 at 07:01 JST**

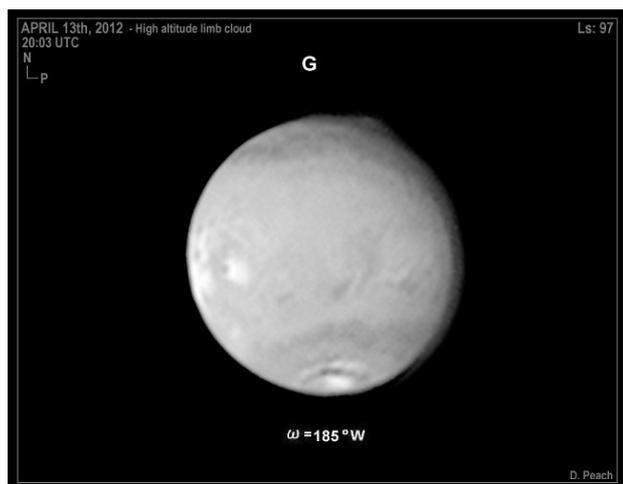
Hi all, Some very good seeing on this night. Here is a set of RGB images and also a detailed B image i obtained that despite the rapidly dwindling apparent diameter showing some delicate cloud structures across the disk. The Olympus cloud appears brilliant.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120413/DPc13Apr12.jpg>  
[http://www.damianpeach.com/mars1112/2012\\_04\\_13rgb.jpg](http://www.damianpeach.com/mars1112/2012_04_13rgb.jpg)  
[http://www.damianpeach.com/mars1112/2012\\_04\\_13blue.jpg](http://www.damianpeach.com/mars1112/2012_04_13blue.jpg)

Best Wishes

○...**Subject: Mars high altitude limb cloud (April 13th, 2012.)**  
**Received; 6 May 2012 at 07:36 JST**

Hi all, Images from the April 13th session clearly show the southern high altitude limb cloud again. I've attached a G filter image showing the feature protruding above the SW limb.



[http://www.damianpeach.com/mars1112/2012\\_04\\_13cloud.jpg](http://www.damianpeach.com/mars1112/2012_04_13cloud.jpg)

Best Wishes

○...**Subject: Mars images (April 14th, 2012.)**  
**Received; 7 May 2012 at 22:26 JST**

Hi all, Here are some images from the 14th. Brilliant Tharsis orographic features toward the limb. Delicate clouds

across the disk again similar to the day before.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120414/DPc14Apr12.jpg>  
[http://www.damianpeach.com/mars1112/2012\\_04\\_14rgb.jpg](http://www.damianpeach.com/mars1112/2012_04_14rgb.jpg)

Best Wishes

○...**Subject: Mars images (April 21st, 2012.)**  
**Received; 9 May 2012 at 03:54 JST**

Hi all, Some very good seeing on the 21st. Extensive clouds across the planet with a B filter image included. Olympus Mons is very dark and prominent. Arsia Mons looks strange - almost like a dark teardrop. Chasma Borealis prominent in the NPC.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120421/DPc21Apr12.jpg>  
[http://www.damianpeach.com/mars1112/2012\\_04\\_21rgb.jpg](http://www.damianpeach.com/mars1112/2012_04_21rgb.jpg)

Best Wishes

○...**Subject: Mars images (May 1st, 2012.)**  
**Received; 20 May 2012 at 23:10 JST**

Hi all, Here are some images from May 1st showing the Chryse hemisphere of the planet.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120501/DPc01May12.jpg>  
[http://www.damianpeach.com/mars1112/2012\\_05\\_01rgb.jpg](http://www.damianpeach.com/mars1112/2012_05_01rgb.jpg)

Best Wishes

○...**Subject: Mars images (May 6th, 2012.)**  
**Received; 21 May 2012 at 06:34 JST**

Hi all, Good seeing just after sundown for these. Syrtis Major nicely presented with bright clouds in Isidis. Some delicate clouds extending out of Chryse nicely seen in the B filter image.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120506/DPc06May12.jpg>  
[http://www.damianpeach.com/mars1112/2012\\_05\\_06rgb.jpg](http://www.damianpeach.com/mars1112/2012_05_06rgb.jpg)

Best Wishes

○...**Subject: Mars images (May 12th, 2012.)**  
**Received; 24 May 2012 at 05:34 JST**

Hi all, Good seeing again on this evening just after sundown. Syrtis Major is nicely placed. NPC region is well resolved with Chasma Borealis prominent. Olympia is also prominent and irregular in appearance. Elysium brilliant near the limb.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120512/DPc12May12.jpg>  
[http://www.damianpeach.com/mars1112/2012\\_05\\_12rgb.jpg](http://www.damianpeach.com/mars1112/2012_05_12rgb.jpg)

Best Wishes

○...**Subject: Mars images (May 13th, 2012.)**  
**Received; 28 May 2012 at 02:19 JST**

Hi all, Very good seeing for these images. Brilliant orographic cloud over Elysium. Olympia is also bright. Some blue clouds over Syrtis Major.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120513/DPc13May12.jpg>  
[http://www.damianpeach.com/mars1112/2012\\_05\\_13rgb.jpg](http://www.damianpeach.com/mars1112/2012_05_13rgb.jpg)

Best Wishes

**Damian PEACH** (Selsey, WS, the UK)

●.....*Subject: Mars 25 April 2012*  
*Received; 2 May 2012 at 06:43 JST*

Dear Masami, I have attached a set of images of Mars from 25 April. The images show bright clouds over Olympus Mons and the Tharsis Range. Also there appears to be a protrusion on the morning limb around Longitude 213°W and Latitude 44°S at a location very near the earlier protrusion reported by Wayne JAESCHKE back on March 20th of this year.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmo/Mars-2012-04-25-SUp%20L-Animation%20B.gif>



I have also attached an animated GIF that shows how the protrusion was consistent in luminance frames taken over a period of 19 minutes. I boosted gamma to a value of 2.5 on the four frames that make up the animation to enhance the visibility of the protrusion on the morning terminator.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120425/WF125Apr12.jpg>

Please give my regards to Masatsugu. Tell him that he has been in my thoughts lately and I am hoping that he is making some progress with his recovery. I think back many times to the wonderful trip to Paris/Meudon in 2009 for the IWCMO Conference and how much I enjoyed meeting him there. Sincerely,

○.....*Subject: Mars25April 2012- Protrusion Animation*  
*Received; 4 May 2012 at 09:49 JST*

Dear Masami, Sorry to send you yet another animated GIF of the protrusion, but I noticed the last GIF I sent

had some problems when being displayed with Apple Safari on some mobile devices. I have fixed those problems and I also enhanced the frames slightly to improve the visibility of the protrusion. I also added the central meridian data for each frame for convenience. You may replace the original one I sent with this new one.

I had some problems with some of the color frames so I am afraid I will not be able to send you a color version of the animation as I promised.

Thank you for your help. Just let me know if you have any questions. Sincerely,

○.....*Subject: RE: Congratulations!*  
*Received; 15 May 2012 at 09:44 JST*

Dear Masatsugu, Good to hear from you and thanks for your comments about the strange mushroom on Mars video I managed to capture. I remember thinking that night that it would just be another night of imaging Mars as it quickly receded from us during the final portion of this apparition. It just goes to show you how many surprises Mars still has in store for us!

I'm still hoping to get in a few more imaging sessions before Mars gets below the trees in my backyard. The forecast is for clear skies later this week so maybe I will have some more images to contribute to the gallery by this weekend.

I wish you the best and I hope you are doing better.

Thanks again for your kind comments. Sincerely,

○.....*Subject: Mars 20 May 2012*  
*Received; 24 May 2012 at 00:23 JST*

Dear Masami and Masatsugu,

I have attached a set of images of Mars from 20 May. The images show bright clouds over Hellas and perhaps some delicate clouds on the morning terminator and over Isidis. The NPC also shows the Chasma Boreale or Rima Borealis rift and also a large dark streak which I believe is exposing Olympia Planitia and separating the NPC outlier Olympia from the NPC.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120520/WF120May12.jpg>

I hope you all are doing well. Best wishes,

**Bill FLANAGAN** (Houston, TX)

●.....*Subject: Mars 26 April*

**Received; 2 May 2012 at 08:36 JST**

Hi All, I have attached some RGB and UV Mars images from 26 April. The orographic cloud over Arsia Mons was not visible, although the clouds over the other great volcanoes were fairly prominent. During southern late spring and summer, the Arsia cloud is often the first to appear and is very prominent -- as in the 2003 apparition. The NPC was tiny with the outliers Lemuria (Olympia) and Ierne still visible.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120426/DPk26Apr12.jpg>

Best,

○...**Subject: Mars 7 May**  
**Received; 8 May 2012 at 04:16 JST**

Hi All, I have attached an RGB Mars image from 7 May. Numerous clouds are present. The NPC is tiny with Ierne visible just to the right of the cap.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120507/DPk07May12.jpg>

Best,

**Don PARKER** (Coral Gables, FL)

●...**Subject: Drawings of Mars**  
**Received; 2 May 2012 at 21:16 JST**

Dear Dr. Minami, Christophe, I have downloaded a new driver software from the site of the maker for my scanner, and now it works out well, so I am attaching here my latest drawings of Mars which I could finally take after almost whole a month(!) of depressive weather.

The red planet has shrunk a bit, but the gradual darkening along the dawn terminator gives a fantastic 3D-like shadowed spherical appearance (I just like it!).

I'd like to direct you, Christophe, a naive question: "Is Hellas presently frosty? or cloudy or both?" ...Lately Hellas looks dim in the morning along the terminator, then it seems to be getting brighter as it proceeding easterly to be most bright near the evening limb...How come it goes like that? ...Is it just an influence of the illumination/terminator-darkening? Or is it related to the daily repeated cloud formation over the area? ...With our instruments' spatial resolution for the smaller apparent size of Mars, is it possible to tell what is covering Hellas, ice crystal cloud? or a thin coat of frost? (visually/including observing well-balanced RGB images, or by analyzing IR, R, G,

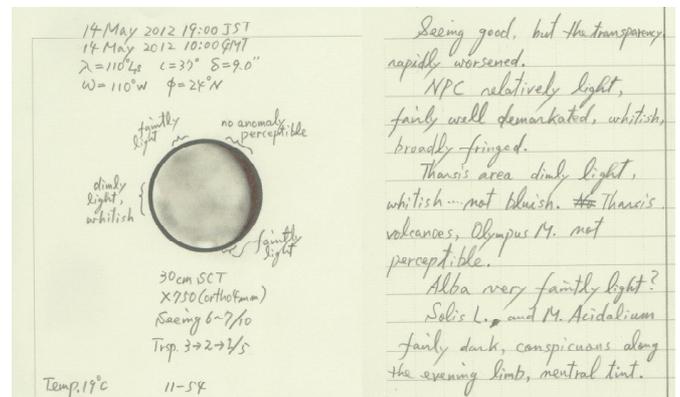
B, UV components' findings).

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120428/Kn28Apr12.jpg>

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120425/Kn25Apr12.jpg>

Good Health/Weather/Seeing!

○...**Subject: Mars drawing**  
**Received; 16 May 2012 at 22:23 JST**



Dear Dr. Minami, Attached here is my latest drawing of Mars. I returned the size of my sketching circle to 30mm across as the red planet's apparent size dropped below 10 arcseconds.

Good Seeing/Health!

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120514/Kn14May12.jpg>

**Reiichi KONNAI** (Fukushima, JAPAN)

●...**Subject: Mars from 10th April**  
**Received; 3 May 2012 at 07:44 JST**

Hi, Here is my last Mars of the apparition, in moderately poor seeing on 10th April.

Hope to put a Mars albedo map together for this apparition in due course.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120410/MLw10Apr12.jpg>

All the best,

**Martin LEWIS** (St Albans, UK)  
[www.skyinspector.co.uk](http://www.skyinspector.co.uk)

●...**Subject: Mars 2012.05.02**  
**Received; 4 May 2012 at 01:18 JST**

Dears, Mars correct conditions last night, with my setup fixed and working:

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120502/MDc02May12.jpg>

<http://astrosurf.com/delcroix/images/planches/m20120502-MDe.jpg>

Bluish clouds are rising on the equator... Sincerely,

○...**Subject: Mars 2012.05.16**  
**Received; 21 May 2012 at 12:46 JST**

Dears, Under correct conditions, with a cloud visible on Elysium, and maybe on the limb and faintly on the equatorial band:

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120516/MDc16May12.jpg>  
<http://www.astrosurf.com/planetessaf/mars/images/planches/m20120516-MDe.jpg>

Steady skies,

○.....*Subject: Mars 2012.05.24*  
*Received; 27 May 2012 at 06:17 JST*

Dears, Under correct conditions, shrinking Mars :

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120524/MDc24May12.jpg>  
<http://www.astrosurf.com/delcroix/images/planches/m20120524-MDe.jpg>

LRGB is presented here as the red layer was taken just over my roof, partially hiding the scope aperture. Green and Blue layers show whitish clouds though, on the limb bright clouds over the Tharsis volcanoes (probably only Ascreaeus and Pavonis Montes), and more north over Alba Patera and inside over Olympus Mons. The polar zone separated into two areas is striking. Sincerely,

**Marc DELCROIX** (Tournefeuille, FRANCE)

<http://astrosurf.com/delcroix>

●.....*Subject: Mars 1-May-2012*  
*Received; 4 May 2012 at 07:31 JST*

Hi Guys we had a rare clear break from these April / May showers, with a bit of useful seeing too. Image is x 240% as it was taken at my "SATURN "mag which is set up nicely just now but a bit less than previous Mars captures.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120501/DTy01May12.jpg>

Dropping down hopefully to Saturn at 21 degrees lower, at 28degs alt., proved to be futile as the seeing was just plain ugly ! I was soon put out of my misery by "those clouds" that just form rather than arrive.

Best wishes

○.....*Subject: Mars 6 May 2012*  
*Received; 7 May 2012 at 21:42 JST*

Hi Guys We had a late break up of the clouds to reveal the full moon and Mars. Seeing was usable too. Mars the incredible shrinking planet appears only 9.5 arc sec diameter now, and is past the meridian in a light sky from up here in the UK..

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120506/DTy06May12.jpg>

It was a welcome sight after all the rain we have had during this drought. Yes we are on hosepipe bans just now !. UK seems to be on a big hill so when it rains most of the water runs into the sea before we can capture it, such a pain, but not before it floods

hundreds of homes! I sure some jobsworth will point out they should not be using a hosepipe to pump the water out of the house. Cheers

○.....*Subject: Mars 11-May-2012*  
*Received; 13 May 2012 at 03:13 JST*

Hi Guys a welcome clearing and fair seeing allowed a reasonable Mars Image, taken in quite a light sky.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120511/DTy11May12.jpg>

Best wishes

○.....*Subject: Mars 13-May-2012*  
*Received; 15 May 2012 at 19:47 JST*

Hi guys we had an evening of good seeing for a change, not excellent, but very welcome. Image is enlarged 240%.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120513/DTy13May12.jpg>

Best wishes

○.....*Subject: solar images up to 13may 2012*  
*Received; 16 May 2012 at 02:30 JST*

Hi Guy I have a new web site type. As you know I normally add the image files to the e-mail, but this time I have just included a link to the May album slide-show, so you have one click armchair viewing.

<http://www.david-tyler.com/image-gallery/?wppa-album=28&wppa-slide&wppa-occur=1>

If you are feeling energetic, you can do a couple of CTRL + clicks to enlarge the page view, or, if you want a longer more detailed look at a particular image, just stop the slide-show on the image and click it again for the original full size view.

If this all works as I hope please let me know, or indeed if it does not !. Best wishes

**Dave TYLER** (Bucks, the UK)

[www.david-tyler.com](http://www.david-tyler.com)

Ham call G4PIE

●.....*Subject: Mars 2012/05/03*  
*Received; 4 May 2012 at 19:14 JST*

Hello, Here is Mars on 2012/05/03.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120503/JPp03May12.jpg>

The seeing was bad. The transparency was fair.

Regards

**Jean-Jacques POUPEAU** (Essonne, France)

●.....*Subject: Mars - April 27, 2012*  
*Received; 5 May 2012 at 15:11 JST*

My Mars images in variable seeing conditions. Still working on a backlog...

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120427/FWI27Apr12.jpg>

○……*Subject: Mars - April 28, 2012*  
*Received; 6 May 2012 at 04:04 JST*

Mars images April 28, 2012 Average seeing conditions.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120428/FWI28Apr12.jpg>

○……*Subject: Mars - April 29, 2012*  
*Received; 13 May 2012 at 05:04 JST*

Hi gentlemen,

My set of April 29, 2012 in poor seeing conditions for now.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120429/FWI29Apr12.jpg>

○……*Subject: May 02, 2012 - Poor seeing*  
*Received; 13 May 2012 at 05:08 JST*

Hi Gentlemen, My set of May 02, 2012 in very poor seeing and windy conditions for now.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120502/FWI02May12.jpg>

○……*Subject: Mars - May 04, 2012*  
*Received; 13 May 2012 at 05:12 JST*

Hi Gentlemen, My set of May 04, 2012 in very poor seeing and windy conditions for now. Seems to continue this weather for now. Only Red and IR742 taken.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120504/FWI04May12.jpg>

○……*Subject: MARS - May 06, 2012 -*  
*Received; 14 May 2012 at 05:11 JST*

Hi Gentlemen, My Mars recordings from May 06, 2012.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120506/FWI06May12.jpg>

Poor seeing and windy at the time of recording.

○……*Subject: MARS - May 08, 2012 - Poor seeing*  
*Received; 16 May 2012 at 12:34 JST*

Hi Gentlemen, My Mars images from May 08, 2012 in poor conditions.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120508/FWI08May12.jpg>

○……*Subject: MARS - May 11, 2012 - Variable seeing*  
*Received; 16 May 2012 at 12:36 JST*

Hi Gentlemen, My Mars images from May 11, 2012 in Variable seeing

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120511/FWI11May12.jpg>

○……*Subject: MARS - May 12, 2012 -*  
*Received; 28 May 2012 at 05:21 JST*

Mars sets of May 12, 2012 - Average seeing Conditions

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120512/FWI12May12.jpg>

○……*Subject: MARS - May 13, 2012 - fair seeing*  
*Received; 28 May 2012 at 05:23 JST*

Mars sets of May 13, 2012 -fair seeing Conditions

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120513/FWI13May12.jpg>

○……*Subject: MARS - May 16, 2012*  
*Received; 30 May 2012 at 16:50 JST*

MARS set of May 16, 2012 - Variable seeing.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120516/FWI16May12.jpg>

**Freddy WILLEMS** (Waipahu, HI)

●……*Subject: Mars May 4th*  
*Received; 6 May 2012 at 23:09 JST*

Here is an image of Mars taken May 4th at 01:58 UT

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120504/EGF04May12.jpg>

<http://www.egrafton.com/05-04-12.jpg>

**Ed GRFTON** (Houston, TX)

●……*Subject: Mars - May 2nd, 4th*  
*Received; 7 May 2012 at 15:03 JST*

Hi Mr. Murakami, Here are two sets from May 2 and May 4, under below average conditions, Clear Skies.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120502/EMr02May12.jpg>

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120504/EMr04May12.jpg>

○……*Subject: Mars - May 12th, 00:41ut*  
*Received; 20 May 2012 at 11:20 JST*

Hi Mr. Murakami, Here is my latest session from May 12th, under average conditions, Clear Skies.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120512/EMr12May12.jpg>

**Efrain MORALES RIVERA**

(Aguadilla, PUERTO RICO)

●……*Subject: Mars, 2, 3 and 5 May*  
*Received; 7 May 2012 at 23:33 JST*

Dear friends, Three more images from early May in brightening twilight. As the disk is getting smaller, unfortunately so seem the image artefacts on the bright limb. Cloud-filled Hellas astonishingly bright on the 5th on the evening side.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120502/JWr02May12.jpg>

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120503/JWr03May12.jpg>

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120505/JWr05May12.jpg>

All the best,

○……*Subject: Mars 6 May 2012, by Martin Högberg*  
*Received; 9 May 2012 at 17:12 JST*

Dear all, I am happy to send you the first Mars image by \_another\_ Swedish planetary imager, Martin Högberg! I think we will see more of his good work.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120506/MHg06May12.jpg>

All the best,

○...**Subject: Mars, 6 and 13 May**  
**Received; 15 May 2012 at 02:31 JST**

Dear colleagues, Mars insists on getting smaller and making life more difficult for us...

Here are two snapshots from May 6 and 13 and you can see clearly the decreased disk diameter between the two dates. May 6 brought me Syrtis on the evening side with a blue cloud and an NPC with cloud patch on its morning side. May 13 brought me just the opposite in terms of disk positions, plus an Elysium orographic (?) cloud. In both cases, Hellas was bright cloud-filled.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120513/JWr13May12.jpg>  
<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120506/JWr06May12.jpg>

Mars can now be seen well only in bright dusk at altitudes less than 40 degrees. Best regards,

○...**Subject: Mars, 16 and 17 May**  
**Received; 21 May 2012 at 06:15 JST**

Dear all, Two images of the favourite planet, one of which from Martin Högborg. Nothing out of the ordinary to write home about.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120516/MHg16May12.jpg>  
<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120517/JWr17May12.jpg>

All the best,

○...**Subject: Mars, 23 and 18 of May**  
**Received; 25 May 2012 at 07:09 JST**

Dear all, Sending you a so-so image of mine from last night May 23rd, plus again the May 18th image by Martin Högborg (cannot yet see it on the CMO web).

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120523/JWr23May12.jpg>  
<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120518/MHg18May12.jpg>

Best regards,

○...**Subject: Mars, 24 and 25 May**  
**Received; 27 May 2012 at 07:26 JST**

Dear all, Two images under less than good conditions; bright twilight and low altitude. Not giving up yet though - Mars is still there, and great fun!

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120524/JWr24May12.jpg>  
<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120525/JWr25May12.jpg>

All the best,

○...**Subject: Mars, 28 and 29 May**  
**Received; 31 May 2012 at 20:31 JST**

Dear friends, Here's two images of tiny Mars from May 28 and 29, taken under rather poor conditions. Except for the Olympia cap outlier there's not much

detail on this contrast hemisphere at this resolution.

I see several days of unsteady weather ahead so this is perhaps my last contribution this apparition. Low altitude and poor seeing will win eventually.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120528/JWr28May12.jpg>  
<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120529/JWr29May12.jpg>

All the best,

**Johan WARELL** (Skivarp, SWEDEN)

●...**Subject: Re: Drawings of Mars**  
**Received; 9 May 2012 at 08:03 JST**

Dear Reiichi, No it's my turn to apologize because I have forgotten to answer to this mail !

Thanks for the delicate drawings. I did notice as well the change of brightness as Hellas proceeds to the limb, but so far I have no answer to give, and I have just not started to study the case (I'm currently working on the Tharsis morning clouds).

As to know if the ground of Hellas is frosted or cloudy, it will be as well hard to answer, just first because both clouds and frost are certainly present. I don't feel that multispectral analysis would help much here ; I'd rather try to consider for example :

- the albedo of the white area. Clouds are bright, but frost may not be bright, as the angle of sunlit is low. Here we may make a parallel with the aspect of the NPC before vernal equinox Ls 0°(like in 2007), where the cap was dull but the last NPH clouds brighter.

- Inside Hellas there is a higher plateau that looks to frost later, or to be less cloudy ; do we see it or not ? (See DPc on 1st april: it is visible). But by the way, we may encounter the case that the basin can be partially frosted, not fully)

- Can we look for indirect clues ? I'm thinking about the "escaping cloud" at the west of the basin. This cloud could be stronger, or even only visible when, the basin starts to frost. It seems to born because a dominant wind carries cold from Hellas. At high HST or probe resolution, small craters under this cloud are covered by frost as well.

Just a few thoughts ! Best wishes,

○...**Subject: EPSC meeting 2012**  
**Received; 21 May 2012 at 21:12 JST**

Dear Masatsugu, In september the EPSC meeting will

take place in Madrid, Spain (remember the ISMO note I wrote for the last meeting in Nantes). There is a session for amateurs whose convener is Marc Delcroix.

<http://meetingorganizer.copernicus.org/EPSC2012/sessionprogramme/AM>

Today I have submitted an abstract to make an oral talk on Mars ; please find it attached. If the abstract is accepted I will talk in name of both SAF and ISMO, and due to the fact that I have retained two of your ideas about Mars (the stationary dust cloud in the day time; the link with solar activity) I have added your name as co-author, I hope that it is fine for you ?

Best wishes,

○.....*Subject: Re: EPSC meeting 2012*  
*Received; 23 May 2012 at 08:47 JST*

Dear Masatsugu: I didn't caught that you were not a member of the OAA anymore. Surely in the process, we'll be able to correct this !

In the meantime I'm still thinking about ISMO notes. Here is a short, partial, update on what I have in mind :

1) The mid-spring orographic cloud over Alba Patera (it gets bigger than the other volcanoes, and much earlier in the season, before fading in late spring). This will introduce the transfer of water vapor from the NPR to the mid-latitudes that is the main thing to know,

2) The cloudless northern hemisphere, a note that deals with the same topic and makes a transition to late spring

3) Something about the ECB, that only appears when the summer hadley cell is getting set from mid spring (perhaps it goes with 2) I think)

4) Tharsis I : morning radiation fogs (cf the abstract)

5) Tharsis II : higher terrains free from fog (Alba Patera and co) that appears as dense reddish areas

6) Tharsis III : the orographics.

7) Frostening of Argyre

8) Frostening of Hellas

9) Something on the polar cap

10) The high altitude cloud (W. Jaeschke) Elysium is missing on the list or any smaller phenomenon, the bluish Syrtis Major... do you see anything more ?

Best wishes,

PS did we send the usual notice mailing for the

current issue of CMO 397 ? I did not received any ?

**Christophe PELLIER** (Nantes, FRANCE)

●.....*Subject: mars.7.may*  
*Received; 9 May 2012 at 13:20 JST*

Hi, Very poor seeing & condition.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120507/SGh07May12.jpg>

Best Wishes,

○.....*Subject: mars 9 may.*  
*Received; 11 May 2012 at 23:45 JST*

Hi, Poor seeing & bad condition.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120509/SGh09May12.jpg>

Best Wishes,

○.....*Subject: Mars&venus.12.may Saturn.9.may*  
*Received; 14 May 2012 at 06:43 JST*

Hi Guys, With poor seeing & variable condition I took 3 images from planets- Moons. PLS see them.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmons/2011/120512/SGh12May12.jpg>

Comment welcome.



Cheers

**Sadegh GHOMIZADEH** (Tehran, IRAN)

●.....*Subject: Re: CMO/ISMO updated*  
*Received; 18 May 2012 at 21:46 JST*

Dear all, and especially our Japanese friends.

Although I did not stop making drawings of Mars, including for this opposition, I am getting more and more overwhelmed by my (astronomical, too) job, plus trips at distance places to view Venus transit or eclipses...

And I did not find time to say that I am right now in Japan, and until the 25th of May. I have been in Niigata since monday (the 14th) for a "Asteroids, Comets, Meteors" meeting with about 400 participants. I will travel to Tokyo Sunday evening for the annular eclipse of Monday (21st) morning, and visit Kyoto on the 22nd to 24th.

I am very sorry that Dr Minami can no longer send us the printed version of the CMO/ISMO and I am

very thankful for what he did for a long time, and I always appreciated receiving it in my mailbox - although I did not take enough time to send my contributions. Sincerely,

○.....*Subject: Re: I am sorry*  
*Received; 20 May 2012 at 00:27 JST*

Dear Masatsugu, Thank you for your kind message - I learned about your health problem, and was not expecting to bother you about my visit in Japan, but since I am in your friendly country, I wanted to say hello from closer to you, even if just by mail. I hope you can enjoy still a bit of the eclipse and the transit of Venus (Even if the weather might not be optimal in Tokyo for us). Regards,

**Nicolas BIVER** (Versailles, France)

●.....*Subject: Mars image Ak19May12*  
*Received; 20 May 2012 at 18:42 JST*

Dear Mr. Minami, I attach Mars image on 19 May 2012. It was little windy evening.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmoms/2011/120519/Ak19May12.jpg>

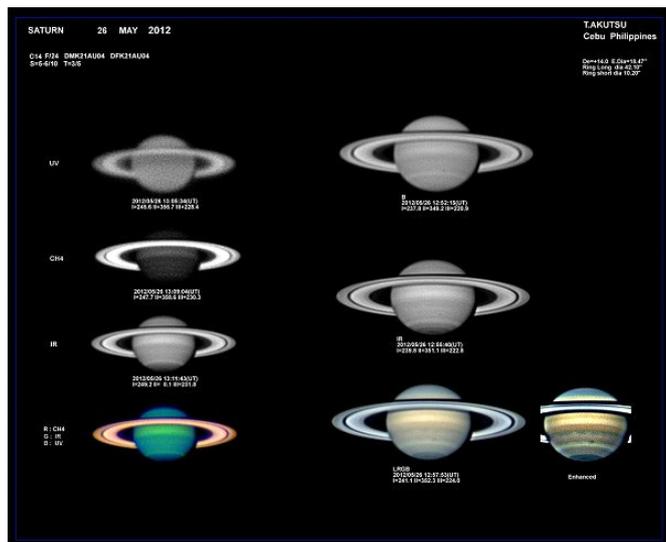
Best Wishes

○.....*Subject: Mars 26 May 12, Saturn 120526*  
*Received; 27 May 2012 at 23:09 JST*

Dear Mr. Minami, I attach Mars image and Saturn image on 26 May 2012. It was little good seeing.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmoms/2011/120526/Ak26May12.jpg>

Best Wishes



**Tomio AKUTSU** (Cebu, the PHILIPPINES)

●.....*Subject: EPSC2012 AM2 session:*  
*Received; 25 May 2012 at 19:24 JST*

Dear all, In case you have not received new this

notice The EPSC Meeting:Â

<http://www.epsc2012.eu/> Â has extended its deadline for submitting abstracts till next Tuesday 29th May.

We are requesting new abstracts for the AM2 session: Amateur contribution to the advancement of planetary science

Amateur astronomy has evolved dramatically over the last years. A motivated amateur, with his/her backyard instrument and adequate imaging processing software is nowadays capable of producing high resolution planetary images in different wavelengths which are better than what professional observatories could produce 15 years ago. Hundredths of regular observers are sharing their work, providing a very good coverage of the main visible planets (Jupiter, Saturn, Mars and Venus) which is very valuable at a time when it is more and more difficult for professionals to access to professional resources focused on other areas of research. Additionally, these networks of amateur observers can react immediately when triggered by a new event occurring on a solar system object requiring observations.

Moreover, some of the advanced amateur astronomers analyze this data to derive analysis which proves to match research criteria and needs, in several areas like planetary meteorology of Jupiter and Saturn, meteoroid or bolide impacts in Jupiter and Venus studies leading regularly to strong collaborations with professionals with an increasing number of published results in scientific peer journals. This session will showcase results from amateur astronomers, working either by themselves or in collaboration with members of the professional community. In addition, members from both communities will be invited to share their experiences of pro-am partnerships and offer suggestions on how these should evolve in the future.

Looking forward to a fruitful session,

**Ricardo HUESO** (SPAIN)

Ricardo Hueso Alonso  
 FÁ-sica Aplicada I  
 Escuela TÁcnica Superior de IngenierÃ-a  
 Alda. Urquijo s/n, 48903, Bilbao (SPAIN)  
 Tel: 00 34 94601 4262  
 Fax: 00 34 94601 4178

●.....*Subject: Apparition notes for Mars*

Received; 29 May 2012 (postal)

Dear Masatsugu, Enclosed my end of apparition notes for Mars. Unfortunately we had a period of three weeks of cloud from April 6 and poor seeing following that. Hoping all is well with you,

Very Best wishes,

The enclosed are a continuation of those sent earlier.

**Alan W HEATH** (Nottingham, the UK)

☆☆☆

**ISMO 11/12 Mars Note (1)**

**The First Maximum of  
the Alba Mons' Orographic Cloud**  
**Christophe PELLIER**

The main topic that we will have to review for the observing notes of the now past 2012 apparition of Mars is the beginning of the "aphelical climate" of the planet Mars. The climate of aphelion is characterized essentially by the peak activity of the white clouds. Those clouds are quite important from around the second half of spring in the northern hemisphere of the planet, to mid-summer when they begin to decline. The reasons why we see so much white clouds when Mars is far from the Sun are well known and we recall them shortly here: during spring, the north polar region releases relatively important amounts of water vapour into the atmosphere, as the cap is subliming; then the cool temperatures encountered by the planet close to aphelion allow water to condensate as clouds.

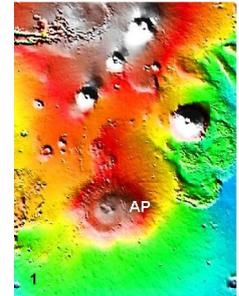
The 2012 apparition of Mars has been ideal to watch for the beginning of that season: opposition took place on march 3rd at  $\lambda = 079^\circ\text{Ls}$ , just  $9^\circ$  past the aphelion (that occurred on feb.13<sup>th</sup>) and  $11^\circ$  before summer solstice ( $\lambda = 090^\circ\text{Ls}$ , 30<sup>th</sup> march 2012). During the period, the NPR had almost finished to release its H<sub>2</sub>O and the clouds were numerous along a wide region around the equator and the tropic of Leo ( $25^\circ\text{N}$ ).

However, not all the martian clouds know their maximum during the defined period of the aphelical climate. We deal here with an interesting anomaly: the early maximum of the Alba Patera's orographic cloud, that happens before the period, during mid-spring and declines later while the other volcanoes best show their own orographics.

Then the Alba cloud is said to welcome a second maximum in mid summer when the others are fading (this will be an observation to be done in 2014 and 2016).

**Geological data**

Alba Mons is an ancient volcano that belongs to the Tharsis bulge. In contrast with the other well known volcanoes such as Olympus Mons, its relief is extremely weak. While being a very wide structure (more than 1000 km) it reaches an altitude of only 6,8 km. The "mount" is so very flat. It's located at a longitude of  $110^\circ\text{W}$  and a latitude of  $40,5^\circ\text{N}$ , much more closer to the polar region than the other Tharsis summits - Olympus, the next one toward



the south, is found at  $18,7^\circ\text{N}$ . See the figure 1 for a crop of the MOLA relief map of Tharsis.

**Climatic milestone**

This is essentially what explains the climatic singularity of Alba Mons: if the trend of its orographic activity is different, this is due to its northern location: as for any of the Tharsis summits, the burst of the cloud follows the available amount of water vapour in the atmosphere: but the maximal amount of water vapour at Alba happens earlier, as it travels from the polar region to the equator. There is more water vapour near Alba at mid-spring than during the summer solstice. The other Tharsis mounts must wait for the end of spring to reach the same state.

The 2012 apparition of Mars has been a good opportunity to watch the greatest Alba cloud. The good period happened before a few weeks before opposition, during January. The season proceeded roughly from  $\lambda=050^\circ\text{Ls}$  to  $\lambda=065^\circ\text{Ls}$  (mid-

spring being at  $\lambda=045^\circ\text{Ls}$ ). The present essay will try to determine when did the apogee of the cloud happened, and when did it fade.

### Preceding references

The phenomenon looks to have been scarcely observed (it must not be well known indeed). The CMO published a note on the topic in 1996 that related observations mostly made in Japan during the end of January 1995<sup>1)</sup>, when they observed a "burst of white-cloud around 26, 27 and 28 Jan perhaps each day in the Martian afternoon". The season was  $\lambda=051^\circ\text{Ls}$ . Don PARKER (*DPk*) also took a good image in 17<sup>th</sup> January ( $\lambda=046^\circ\text{Ls}$ ) when the cloud looks round and large, although not very bright. The HST took images weeks later on  $\lambda=063^\circ\text{Ls}$  (24<sup>th</sup> feb. 1995) but the cloud is rather small, although bright.

On the scientists side, Huiqun WANG and Andrew P. INGASOLL published ten years ago a very interesting article about martian clouds observed by the MGS.<sup>2)</sup> They present some cylindrical maps of white clouds for each martian season (with Ls ranges spanning  $10^\circ$ - $15^\circ$ ). The Alba cloud is clearly more intense in the map for  $\lambda=057^\circ\text{Ls}$  -  $070^\circ\text{Ls}$ . However, the Ls range is quite wide and is not meant to fit the Alba season so the precision of this clever work is not satisfying here.

### The local martian hour (LMH)

Many martian phenomena are varying with the time through each sol (the martian day), especially orographic clouds, that are well known to start developing around noon and to grow bigger through the afternoon. It sounded interesting to the author to determine the local hour on Mars for a given daily cloud behaviour; moreover, the change of the angle of view from Earth does not allow us to see the same martian hour at the same position on the apparent disk. So comparisons of images taken over several weeks can be awkward if your goal is to determine if there is a seasonal variation of the side of a cloud.

The WinJupos software now gives the coordinates of the sub-solar point on Mars (the geographical coordinates of the point where the Sun is exactly at the zenith), and two data: the time difference between a detail of the disk and the sub-solar point, that defines where is the 12H00 meridian

(tS); and the height of the Sun above the detail (hS). The hS is probably not helpful here but it will serve later. It is then easy to calculate the local martian hour (LMH) thanks to tS (example: tS = -2,5: so LMH is 9H30 mn. Note that WinJupos uses 24 hours and not 24H40 mn as it would be in terrestrial time)

So better than presenting the longitude of the central meridian on images, we present here the LMH of the Alba's cloud and direct comparisons can be made.

### Early observations in late 2011

The cloud is first observed in November 2011, at a very weak state. Some possible very first records have been taken on November 2<sup>nd</sup> by Sean WALKER (*SWk*) and Peter GORCZYNSKI (*PGc*) at  $\lambda=024^\circ\text{Ls}$ ; the area is clear although even in blue light it's not easy to be sure that this is a cloud



manifestation. It's more easy to catch on an image taken

at the end of the month by John SUSSENBACH (*JSb*, 28<sup>th</sup> November), and the other Tharsis orographic features are detected as well, but everything is weak. See figure 2.

In early December, both *PGc* and *SWk* again imaged the cloud at  $\lambda=038^\circ\text{Ls}$ , but the shoots are



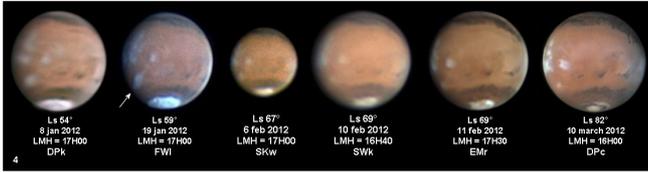
very similar to that of *JSb* a few days before, and the cloud is just barely observed very close to the evening terminator.

At the end of the month, Sadegh GHOMIZADEH (*SGh*) shot it on two consecutive days but shortly after local noon, at a time when the clouds are just begin to develop, and everything is still weak. See figure 3.

### Local evening images taken during winter 2012

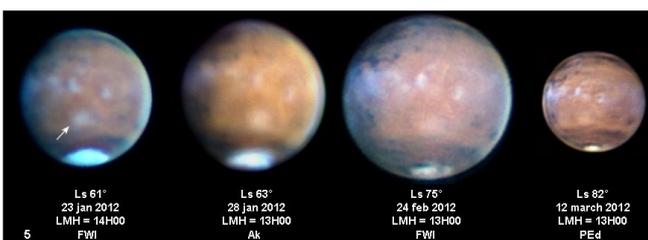
The first obvious sign of a noticeable increase in the size of the Alba cloud is found on an image taken by *DPk* on 8<sup>th</sup> January 2012 ( $\lambda=054^\circ\text{Ls}$ ). The local martian time is 17H00 on this image, it's late afternoon and this is an hour when orographic

clouds are strong. On this image, the reader will note that the Alba cloud is the biggest of the five Tharsis clouds: this is a good indication to follow. This was not the case on the previous studied images where the biggest looks to be the Olympus one.



Now on figure 4 we can compare several images taken during late martian afternoon from November 2011 to March 2012 - almost all images show the area around 17H00 LMH. The most impressive shots have been taken on January 19<sup>th</sup> ( $\lambda=059^\circ\text{Ls}$ ) by Freddy WILLEMS (*FWI*), under good seeing. The Alba cloud is noticeably bigger than any other Tharsis orographic (note that some additional details are visible: the little tail toward Olympus, that could be a sign of a trade wind; and the dark eastern border, that could even be the shadow of the cloud?).

There are several interesting evening shots during February and March when more observers were braving the cold, and all seems to show a neat decrease of the cloud already from the first decade of February, some three weeks after *FWI*'s set on 19<sup>th</sup> January. Silvia KOWOLLIK (*SKw*) observed on the 6<sup>th</sup> and although easy to see, the Alba cloud does not seem bigger than the others. This looks confirmed on the 10<sup>th</sup> and 11<sup>th</sup> by *SWk* and Efrain MORALES (*EMr*). The last image of the 4<sup>th</sup> figure has been secured by Damian PEACH (*DPc*) one month later at  $\lambda=082^\circ\text{Ls}$  and although Alba is at



16H LMH and not 17H, the cloud is obviously much fainter.

## Local noon images during winter 2012

Local noon images also brought interesting results (figure 5). Some good images have been taken in late January by *FWI* and Tomio AKUTSU (*Ak*) (23<sup>rd</sup>; 28<sup>th</sup> Jan.,  $\lambda=061/063^\circ\text{Ls}$ ), where the Alba cloud has a patchy and wide aspect around 13/14 LMH. In February, the cloud is still wide but fainter one month later (*FWI*; 24 Feb at  $\lambda=075^\circ\text{Ls}$ ), and in mid-march the light colour is due to the ground and no cloud is detected on an image taken by Peter EDWARDS (*PEd*) on the 12<sup>th</sup>. There is no intermediate image between 28<sup>th</sup> January and 24<sup>th</sup> February that shows Alba at LMH = 13H (or 14H). Jean-Jacques POUPEAU (*JPp*) took a set on 12<sup>th</sup> Feb. at LMH = 12H where the cloud looks fainter than on *Ak*'s image on 28<sup>th</sup> Jan. but the earlier hour could as well explained the difference, the cloud being of course less dense if we refer to a daily evolution.

In conclusion we can cross the local noon and local evening images to try to determine the best period to observe the greatest Alba cloud. The figures 4 and 5 tell us that the cloud began to grow between  $\lambda=050^\circ\text{Ls}$ - $055^\circ\text{Ls}$ , and began to decline from around  $\lambda=060^\circ\text{Ls}$ - $065^\circ\text{Ls}$ . The most impressive aspect is observed at the end of January near or just before  $\lambda=060^\circ\text{Ls}$ . The data is not good enough for lack of images to be more confident, but it looks safe to say that in 2012 the maximum of the Alba cloud occurred around  $\lambda=060^\circ\text{Ls}$ , shortly before aphelion but a bit later than mid-spring.

**Note (1):** Minami M, On the White-Cloud Activity of Alba Observed at the End of January 1995 at  $051^\circ\text{Ls}$ , *CMO#179*, 25 September 1996.

<http://homepage2.nifty.com/~cmo/95Note13.htm> or  
<http://www.hida.kyoto-u.ac.jp/~cmo/cmomn0/95Note13.htm>

**Note (2):** Wang, H., Ingersoll, A. P., Martian clouds observed by Mars Global Surveyor Mars Orbiter Camera, *Journal of geophysical research*, vol. 107, No. E10, 5078, 2002.

# TEN YEARS AGO (206)

----CMO #261 (25 June 2002) pp3351~3378 ----

<http://www.hida.kyoto-u.ac.jp/~cmo/cmomn1/cmo261/index.htm>

Observation season came to the end as the angular diameter of Mars was under 4". However MORITA (Mo) continued his observation work until the end of May. The observation report thus counted #24. R McKIM (RMk) sent us his further observations made in May 2001 ~ February 2002.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmomn0/01Repo24.htm>

2001 Mars CMO Note (7) treated "Dissipation of the 2001 Dust Cloud Compared with Previous Cases" and conjectured about the decay mode of the 2001 Great Dust Storm and compared with the large preceding dust clouds which were seen before, especially picking out those in 1956 and 1973 as well as the storm observed in 1977. This time however we just compared the periods when the dust cloud covered but neglected the differences of the season and the strength of the storm. The decay mode also varied. It was stated just that the standard scale of the decay mode of each dust storm should be compared by a restoration of the white cloud activity.

<http://www.hida.kyoto-u.ac.jp/~cmo/cmomn0/261Note7.htm>

As LtE, we received from J BEISH (FL), C.-H. TSAI (Taiwan), R McKIM (the UK), T DOBBINS (OH), D PEACH (the UK), W SHEEHAN (MN), C SHERROD (AR), A HEATH (the UK) from abroad, and domestically from T AKUTSU, Y MORITA, K HORIKAWA, T HIKI, H ISHADOH, T IWASAKI, T KUMAMORI, K OKANO et al. From J BEISH who returned home we received a lot of emails. Bill SHEEHAN sent us a long email and made arrangements for the LOWELL conference to be held at Anamidzu in 2004. PEACH's was concerned with his opening a web page. Alan HEATH communicated about the gathering of five big planets in the evening skies in May.

TSUNEMACHI's Antares corner counted #20, and she wrote about the posture and makeup and so on used in Kabuki=traditinal stage dramas since the Edo period. Especially the broad rings around the eyes, called KUMADORI were featured.

TYA #082 treated CMO #118 (25 June 1992) and from this issue the writer changed from M MURAKAMI to T HIKI. First the observation of Mars was mentioned since the observation had become possible in early morning. CMO#118 was opened by the article written by R McKIM about the 1992/1993 apparition. The next article was "1990 OAA Mars Section Note (6)" which treated the frequency distributions of the observations of members in 1990.

MINAMI also wrote about a classical Note by Norinaga MOTOORI (1730-1810) whose words might have been instructive to any observers.

This issue contained letters from editors in which it was written that the issue was edited in a room of the Mikuni hospital where MINAMI's mother was confined.

A new column written by MURAKAMI began from this issue: He first picked out his mind how he felt when he had to leave the garden and house at Fujisawa where he stayed for 20 years, by alluding to the white summer Japanese camellia he nursed at Fujisawa.

(Mk & Mn)

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COMMUNICATIONS IN 東亜天文學會「火星通信」since 1986

# MARS

# No. 261

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OBSERVATIONS Published by the OAA Mars Section

CMO 2001 Mars Report # 24 — OAA Mars Section

が.....火星は西の空低く去って行った(合は12Aug). 最後の観測を森田行雄(Mo)氏が果敢に以下のように遂行している。視直径φは3.8秒角であるが、ccdでは4秒角で充分観測開始が可能で、次回は十一月下旬から、ということになる。来期も森田さんの活躍を期待する。

MARS has gone from the lower western sky (it will be at conjunction on 12 August), but Yukio MORITA chased it until 26 May (018° Ls) as follows:

MORITA, Yukio 森田 行雄 (Mo) 廿日市 Hatsuka-ichi, Hiroshima, Japan  
3 Sets of CCD Images (19, 25, 26 May 2002)

f/50 @ 25cm speculum equipped with an ST-5C

19May, 26Mayで、季節はそれぞれ015° Ls, 018° Lsであった。十一月再会時には098° Lsまで進んでいる。中央緯度φはこのMo氏の時点で7°N~8°Nであるが、十一月にはφ=22°Nとなるから、北極冠が好く見えている筈である。

据て、Mo氏の像は19Mayでφ=205° W, 25Mayでφ=242° W, 26Mayでφ=229° Wであったが、模様は幽かに見えるものの同定は出来ない。どの光源でも北極冠も不明である。

MORITA's images on 19 May (015° Ls) were taken at φ=295° W, on 25 May at φ=242° W and on 26 May at φ=229° W. The disc diameter was only 3.8 arcsecs, and the central latitude φ was 7°N~8°N. The images however don't produce any implication in any light. We are sure Mo will start again from the late November when the diameter draws upto 4 arcsecs. The season will proceed to 100° Ls and the npe will be visible since φ=22° N.

We Further Received several selected drawings from Richard McKIM (RMk), Director of the BAA Mars Section.

McKIM, Richard J リチャード・マッキム (RMk) ピーターボロ Peterborough, UK

43 Sets of Drawings (22, 24, 29/30 May; 4, 9, 21, 22, 27, 28, 30 June;

1, 3, 4, 6\*, 29, 31 July; 10, 13, 29 August; 25, 29 September;

6, 31 October; 13, 19, 26 November; 1, 8, 29 December 2001;

2, 19 January; 14, 28 February 2002)

255, 410x41cm Dall-Kirkham, 140, 350x30cm spec\*, 130, 250x20cm refractor\*

\*Petrin Observatory, Prague, Czech Republic

RMk's A4 sheets (1~33 as we tentatively numbered) show the drawings as well as the intensity estimates which are dated as follows. These are precious (as well as N BIVER's drawings) because they show the aspects of the 2001 dust storm observed from the ill-conditioned Europe:

3 3 5 1

# Ephemeris for the Observations of the 2011/12 Mars. XII

## July 2012

### Masami MURAKAMI

Date (00:00GMT)	$\omega$	$\varphi$	$\lambda$	$\delta$	$\iota$	$\Pi$	$D$
30 June 2012	233.06°W	26.4°N	132.15°Ls	6.64"	39.2°	26.0°	+01°08'
01 July 2012	223.36°W	26.4°N	132.64°Ls	6.61"	39.2°	26.2°	+00°55'
02 July 2012	213.66°W	26.4°N	133.13°Ls	6.58"	39.2°	26.5°	+00°41'
03 July 2012	203.95°W	26.4°N	133.61°Ls	6.54"	39.1°	26.8°	+00°28'
04 July 2012	194.24°W	26.4°N	134.10°Ls	6.51"	39.1°	27.0°	+00°14'
05 July 2012	184.53°W	26.4°N	134.59°Ls	6.48"	39.1°	27.3°	+00°00'
06 July 2012	174.82°W	26.4°N	135.08°Ls	6.45"	39.0°	27.6°	-00°13'
07 July 2012	165.10°W	26.3°N	135.56°Ls	6.41"	39.0°	27.8°	-00°27'
08 July 2012	155.38°W	26.3°N	136.05°Ls	6.38"	38.9°	28.1°	-00°41'
09 July 2012	145.66°W	26.3°N	136.54°Ls	6.35"	38.9°	28.3°	-00°55'
10 July 2012	135.94°W	26.3°N	137.04°Ls	6.32"	38.8°	28.6°	-01°09'
11 July 2012	126.21°W	26.2°N	137.53°Ls	6.29"	38.8°	28.8°	-01°23'
12 July 2012	116.48°W	26.2°N	138.02°Ls	6.26"	38.7°	29.1°	-01°37'
13 July 2012	106.75°W	26.1°N	138.51°Ls	6.23"	38.6°	29.3°	-01°51'
14 July 2012	097.01°W	26.1°N	139.01°Ls	6.21"	38.6°	29.6°	-02°05'
15 July 2012	087.29°W	26.1°N	139.50°Ls	6.18"	38.5°	29.8°	-02°19'
16 July 2012	077.54°W	26.0°N	139.99°Ls	6.15"	38.4°	30.1°	-02°33'
17 July 2012	067.79°W	26.0°N	140.49°Ls	6.12"	38.4°	30.3°	-02°47'
18 July 2012	058.05°W	25.9°N	140.99°Ls	6.10"	38.3°	30.6°	-03°02'
19 July 2012	048.30°W	25.9°N	141.48°Ls	6.07"	38.3°	30.8°	-03°16'
20 July 2012	038.56°W	25.8°N	141.98°Ls	6.04"	38.2°	31.1°	-03°30'
21 July 2012	028.81°W	25.7°N	142.48°Ls	6.02"	38.1°	31.3°	-03°45'
22 July 2012	019.06°W	25.7°N	142.99°Ls	5.99"	38.1°	31.5°	-03°59'
23 July 2012	009.30°W	25.6°N	143.49°Ls	5.97"	38.0°	31.8°	-04°13'
24 July 2012	359.55°W	25.5°N	143.99°Ls	5.94"	37.9°	32.0°	-04°28'
25 July 2012	349.79°W	25.4°N	144.49°Ls	5.92"	37.8°	32.2°	-04°42'
26 July 2012	340.03°W	25.4°N	145.00°Ls	5.90"	37.8°	32.4°	-04°57'
27 July 2012	330.28°W	25.3°N	145.50°Ls	5.87"	37.7°	32.7°	-05°11'
28 July 2012	320.51°W	25.2°N	146.00°Ls	5.85"	37.6°	32.9°	-05°26'
29 July 2012	310.75°W	25.1°N	146.51°Ls	5.83"	37.5°	33.1°	-05°40'
30 July 2012	300.99°W	25.0°N	147.02°Ls	5.80"	37.4°	33.3°	-05°55'
31 July 2012	291.22°W	24.9°N	147.52°Ls	5.78"	37.3°	33.5°	-06°10'
01 August 2012	281.46°W	24.8°N	148.03°Ls	5.75"	37.2°	33.7°	-06°24'

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**CMO #399/ ISMO #25 (25 June 2012)**

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