

## MARS

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## OBSERVATIONS

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### 2016 CMO/ISMO Mars Observations Made During the Fortnight Period from 1 July ( $\lambda=178^\circ\text{Ls}$ ) to 15 July ( $\lambda=186^\circ\text{Ls}$ ) 2016

♂..... This is the 12<sup>th</sup> Report of the 2016 CMO/ISMO Mars observations: We here deal with the observations made during the fortnight period from 1 July to 15 July 2016. The planet Mars was stationary at the end of the preceding month, and then went in the prograde direction in the Libra constellation. The apparent declination  $D$  kept near  $21^\circ\text{S}$ . The apparent diameter went down from  $\delta=16.3''$  to  $\delta=14.6''$  during the period. The phase angle  $\iota$  increased from  $30^\circ$  to  $37^\circ$ . The Martian season proceeded from  $\lambda=178^\circ\text{Ls}$  to  $\lambda=186^\circ\text{Ls}$ . It was on 4 July that the southern spring equinox  $\lambda=180^\circ\text{Ls}$  visited. The tilt was a bit back from  $\phi=16^\circ\text{N}$  to  $\phi=15^\circ\text{N}$ . Because of this tilt and the deep phase angle it became difficult to see the arctic polar region, though the north polar hood must have been formed at around the present season. On the opposite southern hemisphere, the season of the possible dust disturbances has come. It was at  $\lambda=184^\circ\text{Ls}$  that the global dust storm was entrained in 2001. At around  $\lambda=205^\circ\text{Ls}$ , the dust disturbance was often observed, and hence we are now in a position to wait for the dust storms to chase.

♂..... This period, we received a total of 54 observations from 21 observers as follows: We further received a number of observations made before the present period from Marc JUSTICE, Reichi KONNAI, Paul MAXSON, Damian PEACH and Gary WALKER.

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

2 Sets of RGB + 2 IR Images (3, 6 July 2016) 32cm Spec with an ASI290MM

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

5 Sets of LRGB Images (1, 4, 5, 14, 15 July 2016) 36cm SCT @f/17 with a PGR GS3-U3-32S4M-C

**FOSTER, Clyde (CFs)** Centurion, SOUTH AFRICA

9 Colour + 9 IR Images (1, 3, ~6, 13, ~15 July 2016) 36cm SCT @f/33 with an ASI224MC

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

2 Sets of RGB images (6, 7 July 2016) 18cm Maksutov Cassegrain with an ASI290MM

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

1 Colour Image (3 July 2016) 31cm Spec, with a SONY HC9 Video Cam

**KARDASIS, Manos (MKd)** Glyfada-Athens, GREECE

2 Colour Images (3, 6 July 2016) 36cm SCT with a DBK21AU618

**KONNAÏ, Reiichi (Kn)** Fukushima, JAPAN

4 Colour Images (10, 11 July 2016) 41m SCT with an ASI 224MC

**KUDOH Hidetoshi (Kd)** Cairns, QLD, AUSTRALIA

1 Colour Image (12 July 2016) 20cm Spec with a QHY5L-II-C

**KUMAMORI, Teruaki (Km)** Sakai, Osaka, JAPAN

2 LRGB + 2 B Images (6 July 2016) 36cm SCT @ f/38 with an ASI 224MC & ASI 178MM

**LEWIS, Martin (MLw)** St. Albans, Hertfordshire, the UK

1 Colour Image (3 July 2016) 44cm Spec with an ASI174MC

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

6 Colour Images (1, 3, 6, 11, 13, 15 July 2016) 25cm SCT with a ToUcam pro II

**MORALES RIVERA, Efrain (EMr)** Aguadilla, PUERTO RICO

8 Sets of RGB Images (2, 6, 8, 9, 11,~13, 15 July 2016) 31cm SCT with a Flea 3

**OHSUGI, Tadao (Og)** Komatsu, Ishikawa, JAPAN

3 Colour Images (3, 10, 15 July 2016) 25cm Dall-Karkham with an ASI290MC

**SCHULZ, Robert (RSz)** Vienna, AUSTRIA

1 Colour Image (1 July 2016) 20cm SCT with an ASI 290MM

**WALKER, Gary (GWk)** Macon, GA, the USA

4 Sets of RGB Images (2, 4, 8, 14 July 2016 ) 25cm Refractor with an ASI 174MM

**WARELL, Johan (JWr)** Lindby, Skivarp, SWEDEN

1 Set of RGB Images (3 July 2016) 22cm speculum @f/23 with a DBK21AU618

**WESLEY, Anthony (AWs)** NSW, AUSTRALIA

1 IR Image (7 July 2016) (51cm Spec with a PGR GS3-U3-32S4M)

**WILSON, Tim (TWI)** Jefferson City, MO, the USA

1 B + 1 IR Images (5 July 2016) 28cm SCT with an ASI 120MM

♂..... We further received a total of 37 observations made before the present period from

**JUSTICE, Mark (MJs)** Melbourne, AUSTRALIA

3 Sets of RGB Images (1 June 2016) 30cm Spec with a DMK21AU618

**KONNAÏ, Reiichi (Kn)** Fukushima, JAPAN

11 Colour Images (14\*, 18, 22, 28 May; 1, 2, 10\*, 18 June 2016)

41m SCT with an ASI 224MC & ASI 178MC\*

**MAXSON, Paul (PMx)** Surprise, AZ, the USA

9 Sets of RGB + 9 IR Images (2, 4, ~10, 12 June 2016) 25cm Dall-Kirkham with an ASI 290MM

**PEACH, Damian (DPc)** Selsey, WS, the UK (Expedition to Barbados Islands)

5 RGB Colour + 3 B Images (5, 8 June 2016)

**WALKER, Gary (GWk)** Macon, GA, the USA

9 Sets of RGB Images (25 May; 11, 14, 23, ~25, 28 June 2016 ) 25cm Refractor with an ASI 174MM

♂..... We now begin to touch briefly on each observation chronologically (we are sorry however to postpone the review of the observations made earlier to another occasion).

**1 July 2016 ( $\lambda=178^\circ\text{Ls}-179^\circ\text{Ls}$ ,  $\delta=16.3''-16.2''$ ,  $\varphi=16^\circ\text{N}$ )**

**Frank MELILLO (FMI)** gave a single colour image at  $\omega=205^\circ\text{W}$ . The inside of Elysium is slightly

light on the morning side. Phlegra is brownish, as dark as the Ætheria dark patch. The arctic area is thickly whitish. The SN line is dubious.

**Bill FLANAGAN (WFI)**'s LRGB is made at  $\omega=244^\circ\text{W}$ . The Ætheria dark patch is detailed. The r.h.s. split canal looks to have been slightly deformed. The spc is a bit visible. The reddish tint of Ausonia Australis is not so vivid. Syrtis Mj is gloomy near the morning terminator. Hellas is beneath the morning haze. The northern Utopia is largely covered by two less-bright smooth hazes. M Cimmerium is detailed but slightly blurred.

**Clyde FOSTER (CFs)** was at  $\omega=086^\circ\text{W}$ . To the east of Solis L the evening haze is visible. Is there a thinner haze belt lying to the north of Solis L? The area of dark brownish Ganges and the Fortuna doughnut ring are quite exposed near the CM, while the tint is dirty. The area of Tithonius L is preferably depicted. The Tharsis summits are quite visible due to the lower/thinner covering of the airborne dust. Olympus Mons is also ominously inside the disk. The arctic region is largely covered by a whitish cloud, but M Acidalium is rather totally shown up.

**Robert SCHULZ (RSz)** was at  $\omega=128^\circ\text{W}$ . The spc is not caught, but the limb haze governs whole the disk. Evening haze might have been bright near the equatorial level. The description of the arctic cloud is good. Just the area around Solis L and the Tharsis ridges should be more elaborated.

**2 July 2016 ( $\lambda=179^\circ\text{Ls}$ ,  $\delta=16.2''-16.1''$ )**

**Gary WALKER (GWk)** obtained a nice set of 174MM images for the RGB composite at  $\omega=201^\circ\text{W}$ . The spc is clearly shown up. Inside the morning Elysium, a branch of Phlegra is sharply depicted all in R, G, and B (but slightly excessive in B). The branch was evident on an early occasion when the area became beneath the dust storm in 2001. The present image is good at the brownish colour and Valhalla is quite visible. The Ætheria dark patch is weaker yet and the preceding ground-lit streak is also weak on the early morning side. Olympus Mons is never whitish though it's near the evening limb. The depiction of the arctic cloud/mist is sensible.

**Efrain MORALES (EMr)** was at  $\omega=209^\circ\text{W}$ . The spc is very evident, though the NS axis does not look perpendicular. The description of the Elysium region is outstanding, and the broad Phlegra is dark brownish with Trivium Charontis of a few dark spots inside. Propontis I and the Ætheria dark patch are of dark blue. The ground-lit streak preceding the latter is also bounded by a dark line (which is also preceded by a thinner dark segment). Valhalla is visible, but no detail of M Cimmerium is obvious. The arctic region is largely overcast. Limb haze is seen whole over the disk. Especially the evening haze preceding the area of Olympus Mons is heavy.

**3 July 2016 ( $\lambda=179^\circ\text{Ls}-180^\circ\text{Ls}$ ,  $\delta=16.1''-16.0''$ )**

**FMI** gave an image at  $\omega=178^\circ\text{W}$ . We don't understand the implication of three colour decompositions of a single colour cam image. As was expected, Propontis I is shown in dark black on the B image.

**Tsutomu ISHIBASHI (Is)** was at  $\omega=321^\circ\text{W}$ . Syrtis Mj is vaguely seen. Is it impossible to show the colour of the arctic cloud?

**Tadao OHSUGI (Og)** was at  $\omega=342^\circ\text{W}$ . Though such minor markings as Neudrus, the Ods are shown, while the whiteness of the polar regions is not shown up. It is an urgent issue to depict the circumpolar cloud activity at the arctic region.

**CFs** gave an L-colour image at  $\omega=047^\circ\text{W}$ . The colour cam may not produce the ghost limb line, but the stacking with the L images must not be preferable. The area of Ganges could have been much clearer in colour, even if the whole disk is beneath the global airborne dust. Notable is the shape of the cloud belt lying at the northern end of M Acidalium. There must be a stationary front of the arctic weather.

**Manos KARDASIS (MKd)** gave a DBK image at  $\omega=097^\circ\text{W}$ . Now the season  $\lambda=180^\circ\text{Ls}$  has been attained. The sharpness of such markings as Tithonius L and so on look a bit unsatisfactory, but the description of the limb sides is reasonable. Ascræus Mons and other Tharsis Montes are checked, and Olympus Mons is also caught near the morning terminator. The cloud at the northern end of M Acidalium is still visible as a white patch on the evening limb. The faint white gas at the arctic area is also present.

**Martin LEWIS (MLw)**'s 174 MC colour cam image at  $\omega=106^\circ\text{W}$  looks stable with the hazy limb circle. Ganges is brownish dark, and the Tharsis dots are poked out followed by Olympus Mons. The limb cloud patch observed by MKd is still bright visible at the limb. The arctic haze is much weaker.

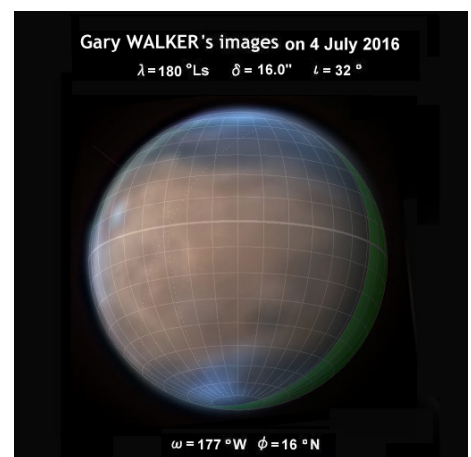
**Johan WARELL (JWr)** obtained an RGB image at  $\omega=112^\circ\text{W}$ . The evening limb is light. The areas around Solis L and M Acidalium are darker. The surface looks greenish pale in colour.

**Marc DELCROIX (MDc)** gave an RGB image at  $\omega=117^\circ\text{W}$ . Dark markings look blurred, and so the area of Tithonius L loses shape. However the limb hazes are well shown. The arctic haze is large, and the white limb patch associated with the declining M Acidalium is still visible (obvious in B)

#### 4 July 2016 ( $\lambda=180^\circ\text{Ls}$ , $\delta=16.0''\sim 15.9''$ )

**GWk** gave a good set of 174MM components and the RGB composite at  $\omega=177^\circ\text{W}$ . Near the evening limb, an oblique white cloud patch is shown up which must be the one associated with Arsia Mons. The cloud of Arsia Mons shows a peak at  $\lambda=150^\circ\text{Ls}\sim\lambda=180^\circ\text{Ls}$  as often noted [eg, PGc's images on 29 May ( $\lambda=160^\circ\text{Ls}$ ) showed the Arsia cloud - cf CMO n°449], and the present image is at  $\lambda=180^\circ\text{Ls}$ . The present GWk image is also excellent in showing the branch of Phlegra inside Elysium beneath the morning dusky terminator hazy side. The arctic haze is also well mapped, its form and loudness being more explicit on the B image.

N.B. Here is shown the GWk image with the ten degree grids adapted by Mk. The cloud in question is nicely put at the very position of Arsia Mons located at  $(8.4^\circ\text{S}, 121^\circ\text{W})$  since  $177-56=121$ . It will be also possible to measure the positions associated with M Sirenum. We however note that GWk did not give the NS axis perpendicularly: we declined his by about six degrees. We hope everybody could give the NS axis by the use of Don PARKER / Yukio MORITA method.



**WFI** gave a set at  $\omega=214^\circ\text{W}$ . The terminator side is quite dusky/hazy. On the opposite side, Olympus Mons is visible near the evening limb, but does not show any whiteness. Since the phase angle is  $\iota=32^\circ$ , the sunset is three hours ahead. The peak of the Olympus Mons cloud is at around  $\lambda=100^\circ\text{Ls}$  and will be totally inactive by  $\lambda=200^\circ\text{Ls}$ . Phlegra is dark in B just after the CM and so less effective is the airborne dust. However the branch of Phlegra observed on the 2001 dusty occasion is visible here. The double split of the *Ætheria* dark patch is thriving. The B image is very useful to see how interestingly distributed are the arctic clouds.

**CFs's** main L-colour image is at  $\omega=054^\circ\text{W}$ . The aspect of the arctic clouds is nicely depicted: One of the thickest parts of the arctic clouds covers the darkest northern area inside M Acidalium. The area to the north of Melas Chasma (of Tithonius L) looks singularly variable: This time the area is broad and dark. Ascræus Mons is shown up dark near the morning terminator (its eastern flank is lit). The Fortuna doughnut ring is visible. A part of the spc is very brilliant. The ghost limb line at the evening side is annoying.

**5 July 2016 ( $\lambda=180^\circ\text{Ls}$ - $181^\circ\text{Ls}$ ,  $\delta=15.9''$ - $15.8''$ )**

**Tim WILSON (TWI)** gave IR807 and B images at  $\omega=168^\circ\text{W}$ . On the IR, M Sirenum and Propontis I are checked. B implies a presence of a white arctic cloud.

**WFI's** LRGB image is at  $\omega=203^\circ\text{W}$ . The inside of Elysium preceding the *Ætheria* dark patch, and the area of Cerberus-Phlegra are detailed. Propontis I shows also a detail, but the previously associated white cloud has been distinct. The arctic area is largely hazed. To the north of M Sirenum, Valhalla is seen in a brownish tint. The spc is whitish bright though its depth is narrow. Incidentally, if we apply the formula to this depth as was the case on 21 June ( $\lambda=173^\circ\text{Ls}$ ), the snowline turns out to locate at  $56^\circ\text{S}$ : This may be plausible in the present case of  $\lambda=180^\circ\text{Ls}$ .

**CFs's** L-colour images are at  $\omega=017^\circ\text{W}$  and at  $\omega=046^\circ\text{W}$ . The arctic cloud is roundish large to/at the north of M Acidalium. Both show a shadowy hole near the centre and hence this cloud might be a spiral cloud (to be chased frequently). It is interesting to note that the perimeter of the spc on the image at  $\omega=046^\circ\text{W}$  looks to blow out lower gaseous projections. Its sign is already potent on the image at  $\omega=017^\circ\text{W}$  (2 hours before), and hence it should have been chased every 40 minutes.

**6 July 2016 ( $\lambda=181^\circ\text{Ls}$ ,  $\delta=15.8''$ - $15.7''$ )**

**EMr** gave an RGB image at  $\omega=142^\circ\text{W}$ . The limb sides are blurred, and at a glance the central area does not show any conspicuous landmark. Olympus Mons is however suspected to be found near the CM. To the north of OM's area there runs a long light belt which may be related with Ascræus Mons from SE to NW. The arctic area has a cloud patch a bit to the east.

**FMI's** image is at  $\omega=160^\circ\text{W}$ . Propontis I is now visible.

**Peter GORCZYNSKI (PGc)** gave an RGB at  $\omega=163^\circ\text{W}$ . The spc gives a good glimpse. The arctic cloud is as expected, but the easternmost is a bit brighter patch. The desert region looks dirty ochre. Elysium is now inside the disk and the location of Olympus Mons is rather obvious. Notable is the aspect of

M Sirenum: It looks split into two by a lower dust cloud, but not sharply shown. The cloud is a bit associated with Arsia Mons. Propontis I is seen in RGB and R with a cloud to the north of it, while B does not show Propontis I but clearly the associated cloud.

**Teruaki KUMAMORI (Km)** obtained two L-colour images at  $\omega=305^\circ\text{W}$  and at  $\omega=313^\circ\text{W}$ . Both do not tell such a detail as the Baldet crater, but both depict a smooth distribution of the arctic light and shade of white clouds. The large misty/dusty afternoon covering from the area of Hellas down to the area of Syrtis Minor is beautifully described. Hellas is figured out by Yaonis Fr. The whole limb side of the disk is nicely processed.

**CFs's** is at  $\omega=037^\circ\text{W}$ . Several details are shown up, while the general aspects of the dark markings look dirty. Even if the airborne dust globally covers, the surface could not be so dusky because several milestone markings are quite exposed maintaining the details. The arctic cloud is white associated with the weather straightforward front at the north of M Acidalium. The front looks naturally white, but the spc looks off-whitish bright, looking artificial tint.

**MKd** obtained a DBK image at  $\omega=068^\circ\text{W}$ . This is a typical colour-cam image, and markings look to have been made of colours. However the light and shade of the dark markings does not tell their implications. The aspect of the white cloud to the north of M Acidalium is pretty. The summit of Ascræus Mons is blackish dark. However the underlying haze from which Mons poked out is not obvious.

**MDc's** RGB image is at  $\omega=087^\circ\text{W}$ . The peripheral part of the disk is generally dusky due to a gaseous matter. The areas of brownish Ganges and Ophir are lighter, but the morning side is again dusky. The summits of the Tharsis ridges are visible (especially in IR). The limb cloud at the northern part of M Acidalium is bright.

**7 July 2016 ( $\lambda=181^\circ\text{Ls}-182^\circ\text{Ls}$ ,  $\delta=15.7''-15.5''$ )**

**PGc's** is at  $\omega=151^\circ\text{W}$  which is similar to the PGc image at  $\omega=163^\circ\text{W}$  on the preceding day. The disturbance at M Sirenum looks to have recovered.

**Anthony WESLEY (AWs)**'s images are at  $\omega=296^\circ\text{W}$  and at  $\omega=300^\circ\text{W}$  (R or IR). The spc is not distinguishable. The markings to the south of the northern district of Syrtis Mj are fainter. The images look milder, but, since Nodus Alcyonius shows a ghost-like light fringe, they might be the ones processed a bit excessively.

**8 July 2016 ( $\lambda=182^\circ\text{Ls}$ ,  $\delta=15.5''-15.4''$ ,  $\varphi=15^\circ\text{N}$ )**

**EMr's** is at  $\omega=119^\circ\text{W}$ . Just one glance at R tells us that the preceding limb side shows a terrible ghost. However the B image looks good.

**GWk's** RGB is at  $\omega=154^\circ\text{W}$  which is comparable with PGc's images on the preceding day. PGc's RGB shows well the whitish spc, while GWk's spc is bluish misty-like. On the other hand, the arctic cloud looks more realistic on GWk's RGB. Especially on this day, the arctic cloud shows a projection towards SW direction. M Sirenum is darker definite on PGc's RGB and R, while GWk's Sirenum Mare is a bit

blurred (maybe due to an expansion of the circumpolar mist). Expressions of Ascræus Mons and the area of Olympus Mons are quite similar on both images.

#### 9 July 2016 ( $\lambda=182^\circ\text{Ls}$ - $183^\circ\text{Ls}$ , $\delta=15.4''$ - $15.3''$ )

**EMr**'s image set is at  $\omega=118^\circ\text{W}$ . Again the SE limb side is not realistic and the south circumpolar region looks unstable. The arctic cloud shows a tendency similar to the one shown by GWk on the preceding day. EMr clearly shows the doughnut-like bright ring near Fortuna as well as Ascræus Mons.

#### 10 July 2016 ( $\lambda=183^\circ\text{Ls}$ - $184^\circ\text{Ls}$ , $\delta=15.3''$ - $15.2''$ )

**Reiichi KONNAI (Kn)**'s 224MC images are at  $\omega=260^\circ\text{W}$  and at  $\omega=267^\circ\text{W}$ . We further received several Kn's ccd images made during the period from 14 May to 18 June, but not yet reviewed. This case may be the first we deal with his ccd images here (Kn has been known as an excellent visual observer. His first observation this apparition was given on 18 February). The seeing condition here was 2~3/10, and so no more than the gross structures of Syrtis Mj and M Tyrrhenum are shown. Even then the NW end of M Cimmerium is suggestive. At present, the whiteness produced by usual colour camera is never brightly coloured, and hence the depictions of the spc and the arctic cloud are not sufficient. Since Kn has an independent view of his own on the chromogenic variety of the Martian markings and colour gradations, we are afraid he may get frustrated about the present ability of the colour-cam system. We however expect him to challenge the way to an accomplishment of a proficiency in colour camera mechanism.

**Og** gave a 290MC colour image at  $\omega=289^\circ\text{W}$ . Syrtis Mj is near the CM. We felt again that the markings were coarse grained: The dark markings lack the smoothness. The whiteness lacks at the both polar regions. Is not there appearing a chromatic aberration at the southern limb?

#### 11 July 2016 ( $\lambda=184^\circ\text{Ls}$ , $\delta=15.2''$ - $15.1''$ )

**EMr** imaged at  $\omega=109^\circ\text{W}$ . The evening limb is gaseous. The doughnut ring at Fortuna is light evident. Ganges is brownish. Tharsis ridges are shown. The eastern flank of Olympus Mons looks reddish-lit, just apart from the morning terminator. The arctic area is occupied by a large white cloud.

**FMI**'s image is at  $\omega=123^\circ\text{W}$ . Smaller image, but it shows really several pieces of the limb cloud, the evening cloud and the arctic cloud. If the NS axis is verified, the spc will be unearthed.

**Kn** lined up three images at  $\omega=248^\circ\text{W}$ ,  $250^\circ\text{W}$ ,  $259^\circ\text{W}$ . The first image and the second show a vertical segment inside Elysium, but the r.h.s. ground-lit segment looks colourless. The image proves a resolving power of the instrument but the colour gradation is feeble: the reddish aspect of Ausonia Australis should be more evident. Propontis I is well dark near the limb, but unknown how it is on the limb.

#### 12 July 2016 ( $\lambda=184^\circ\text{Ls}$ - $185^\circ\text{Ls}$ , $\delta=15.1''$ - $15.0''$ )

**Now comes the season when the 2001 global dust cloud was entrained.**

**EMr** gave an RGB at  $\omega=095^\circ\text{W}$ . The human shaped Auroræ S is evident on R, while it is beneath the evening haze on the RGB. Nilokeras is evident out of the evening haze. Ganges is brownish, and the ring at Fortuna is clear. The south of Tithonius L (or north of Solis L) is brownish. Ascræus Mons is brownish

and hence this may be outside of the morning haze. Olympus Mons is dusky near the morning terminator. The morning side following Solis L is hazy related with the spc. The large arctic cloud is well described.

**Hidetoshi KUDOH (Kd)** obtained an image at  $\omega=239^\circ\text{W}$ . The evening mist is spread upto the east of Cerberus. The west end of Elysium is well caught including a detail of the Ætheria dark patch. The Elysium Mons cloud is nicely visible by the use of a 20cm instrument. It is also gratifying to see the some details around M Cimmerium, and the complex Hesperia to a reddish Ausonia. The arctic cloud looks large and complex. The spc is well whitish bright. This is a moment Syrtis Mj comes inside the disk (no more bluish).

#### 13 July 2016 ( $\lambda=185^\circ\text{Ls}$ , $\delta=15.0''\sim 14.9''$ )

**FMI's** is at  $\omega=081^\circ\text{W}$ . The seeing condition is better than the preceding, while the colour variation of the evening limb side is poor; maybe more off-whitish. The arctic area is whitish. Solis L is not well separable, but M Acidalium and Nilokeras are well shot. We may say Lunæ Lacus is visible.

**EMr's** is at  $\omega=084^\circ\text{W}$ . The limb haze is not only at the evening side, but also at the morning side. Ascræus Mons is dark evident. Still the ring at Fortuna is clearly seen. Ganges is dark brownish (dark in B). Ophir is bright. The arctic area is overcast. The spc is whitish bright.

**CFs's** L-colour is at  $\omega=327^\circ\text{W}$ . The limb sides are quite hazed, and this may be global. The haze is independent of the spc, and Hellas near the preceding limb is half hazed. The arctic limb area is quite whitish-hazed. The central region must be more usual than the areas of the limb darkening, but even then the central region is also slightly hazed. In these cases it would be improper to squeeze the details by excessive processing. In this sense, the present CFs image looks modest.

#### 14 July 2016 ( $\lambda=185^\circ\text{Ls}\sim 186^\circ\text{Ls}$ , $\delta=14.9''\sim 14.7''$ )

**GWk** gave an RGB image at  $\omega=104^\circ\text{W}$ . The evening side is hazed from S to N. It covers the area of Ophir. The 174MM B image shows that the arctic large cloud consists of two layers which are reflected on the RGB. The morning terminator side is also darkened. At the less affected central area, Ascræus Mons is evident (dark on B) together with the summits of Pavonis and Arsia Montes. The doughnut ring at Fortuna is clearly seen following the brownish Ganges.

**WFI** obtained an LRGB at  $\omega=111^\circ\text{W}$ . On LRGB, the limb side is largely hazed. The B image is very informative: The summits of Tharsis Montes and Olympus Mons are dark (as well as on G), proving a poking-out phenomenon through a lower haze layer. The doughnut light area at Fortuna is also evident in B. The arctic large cloud has a couple of layers. Ganges and its extension are dark in B.

**CFs** imaged at  $\omega=321^\circ\text{W}$ . Similarly to the preceding CFs case, the evening limb side is quite hazed, and generally off-whitish. However, the arctic cloud looks whitish large. A part of Hellas also receives a whitish invasion. The central area is well shown. The IR 685 image shows a southward extension of Yaonis Fr.

#### 15 July 2016 ( $\lambda=186^\circ\text{Ls}$ , $\delta=14.7''\sim 14.6''$ )



**EMr** imaged at  $\omega=066^\circ\text{W}$ . The preceding limb side is well processed, and the off-white haze covers gradually from S Meridiani up to S Auroræ. The southern part of M Acidalium is also gradually covered by the haze, and the northern half is overcast by the beautiful arctic large cloud. Ganges, now on the morning side, is conspicuous with a dark brownish tint. Ascræus Mons is seen near the dusk of the morning terminator.

**FMI**'s image is at  $\omega=072^\circ\text{W}$ . The areas of M Acidalium and Solis L are dark. We may say Ganges and Lunæ L are visible. The arctic cloud is large and obvious. If the NS axis is put on the right place, the spc will show up.

**WFI**'s LRGB image is at  $\omega=102^\circ\text{W}$ . The Fortuna ring looks a bit deformed. It is interesting to see how the shapes of the summits of Tharsis Montes are different from each other. Olympus Mons is now apparent (the eastern flank is lit). Note that the inside of Tithonius L is dark in B. The B image also shows an invasion from the spc region. B also clearly shows the shape of thickest part of the arctic cloud. Ganges and its extension are dark on B. The spc is narrow in depth but quite bright.

**Og**'s image is at  $\omega=208^\circ\text{W}$ . Perhaps every detail is shown up, while every expression has no soft tone. Every dark marking should show a soft gradation. This is also said about the colour. The two light streaks inside Elysium should show its colour gradation: pinkish, whitish and so on. The expression of the arctic area (almost inside Utopia) looks quite strange: The arctic white clouds must have been at the expense of the lack of the soft gradation.

**CFs**' main image is at  $\omega=310^\circ\text{W}$ . This L-colour image looks elegant: The spc is brightly shown up with a thin circumpolar haze. Due to the airborne haze, the dark markings are softly described. Hellas looks to show its bottom. The arctic cloud is nicely described in a geometrical pattern. This part appears interestingly in G and B components. The IR685 image should be softer.

♂.....**N.B.** This time we are sorry but to leave out the review of the "We Further Received" observations. They will be reviewed later on another occasion together.

*(Masatsugu MINAMI and Masami MURAKAMI)*

## *Letters to the Editor*

●.....**Subject: Mars May 27**

**Received: 1 July 2016 at 04:00 JST**

Below average seeing for these May 27 Mars images.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160527/PMx27May16.jpg>

○.....**Subject: Mars May 27**

**Received: 1 July 2016 at 11:41 JST**

Mars, May 28

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160528/PMx28May16.jpg>

○.....**Subject: Mars May 29**

**Received: 4 July 2016 at 11:00 JST**

Very average Mars images.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160529/PMx29May16.jpg>

○.....**Subject: Mars May 30**

**Received: 7 July 2016 at 04:01 JST**

Average seeing.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160530/PMx30May16.jpg>

○.....**Subject: Mars June 2**

**Received: 10 July 2016 at 09:10 JST**

Really bad seeing, but clouds are visible.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160602/PMx02June16.jpg>

○ *Subject: Mars June 4*

*Received: 12 July 2016 at 11:07 JST*

Getting better.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160604/PMx04June16.jpg>

○ *Subject: Mars June 5*

*Received: 15 July 2016 at 08:13 JST*

Improving seeing.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160605/PMx05June16.jpg>

**Paul MAXSON** (Surprise, AZ)

● *Subject: Mars 2016/06/30 1927UT CM114*

*Received: 1 July 2016 at 14:43 JST*

Hi all, Conditions were much improved (above average) last night after the two previous evenings where the seeing was so poor I couldn't get anything decent out. Substantial cloud build up around the NPC continues. Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160630/CFs30June16.jpg>

○ *Subject: Mars 2016/07/01 1808UT CM86*

*Received: 2 July 2016 at 17:56 JST*

Hi all, Unfortunately poor conditions again last night and this was the best I could get out. Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160701/CFs01July16.jpg>

○ *Subject: Mars 2016/07/03 1644UT CM47*

*Received: 4 July 2016 at 05:59 JST*

Hi all, Given the recent weather here, and with incoming cloud, I managed to catch a period of reasonable seeing conditions this evening. There is an impressive cloud bank extending from the far northern Mare Acidalium region towards the west. Also some light cloud over western Valles Marineris and Tharsis regions. I did capture RGB and IR data as well so will see if I get any better result when I have processed them. Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160703/CFs03July16.jpg>

○ *Subject: Mars 2016/07/04 1644UT CM47*

*Received: 5 July 2016 at 06:13 JST*

Hi all, Variable conditions this evening. The cloud structure in the NP region has changed quite substantially from yesterday. Regards,

(PS, my apologies. The images of 1 and 3 July I have sent through over the last few days were incorrectly named as June images. The info and date on the im-

ages however is correct)

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160704/CFs04July16.jpg>

○ *Subject: RE: Mars 2016/07/04 1644UT CM47*

*Received: 5 July 2016 at 12:33 JST*

Thanks, Jim. I find it interesting to see the different shades of colour in the clouds and also the polar cap. I'm assuming the two small clouds north of M Acidalium have some dust content. I also find the very substantial change in the N P cloud structure fascinating. On one of the other forums Damian Peach noted the (very) dark area in M Acidalium. Any comment on this would also be welcome, although it is so dark i just want to check that its not something on the camera (!). I captured some RGB and IR data with the 174MM so will have a look at that today. Regards,

○ *Subject: Mars 2016/07/05 1754UT CM46*

*Received: 6 July 2016 at 04:10 JST*

Hi all, Despite supposedly Jetstream conditions, I seem to be getting some reasonably settled seeing conditions. Image attached from this evening, with more dynamic change in the northern cloud structures. Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160705/CFs05July16.jpg>

○ *Subject: Mars 2016/07/05 1556UT CM17*

*Received: 6 July 2016 at 14:51 JST*

Hi all, A further capture from last night, taken early evening and a few hours before my previous submission. As mentioned, seeing is a bit more consistent now and I would say it was average/above average. Nice to see a bit of detail on the screen when capturing. Out of interest, I note in this image that the Indus "bridge" does not show as complete. It also looks like there is quite a bit of light cloud in the southern hemisphere, which is presumably the result of sublimation from the SPC as things start warming up? Image is a bit noisy, but trying not to wash out fine/subtle detail. I would love to understand the meteorology behind the sometimes sharp edges of the cloud structures (eg the linear cloud of 3rd July and also the northern edge of the large northern cloud in this image. Would it be a result of wind? Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160705/CFs05July16.jpg>

○ *Subject: Mars 2016/07/06 1755UT CM37*

*Received: 7 July 2016 at 22:54 JST*

Hi all, Mars yesterday evening. Variable seeing . I am wary of the dark area in Acidalium(artefact/dust?), although it does appear to be rotating with the planet. I am hoping to capture an image set this evening , and will then be away for the next +-4 nights, so you will have some respite from my emails and submissions

Best regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160706/CFs06July16.jpg>

○.....*Subject: Mars 2016/07/13 1736UT CM327*

*Received: 14 July 2016 at 04:21 JST*

Hi all, Mars this evening under average seeing conditions. Best regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160713/CFs13July16.jpg>

○.....*Subject: Mars 2016/07/14 1746UT CM321*

*Received: 15 July 2016 at 04:49 JST*

Hi all, Mars this evening. Average seeing conditions, deteriorating into the evening. Best regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160714/CFs14July16.jpg>

○.....*Subject: Mars 2016/07/15 1739UT CM310*

*Received: 16 July 2016 at 04:02 JST*

Hi all, Mars this evening. Possibly some dust activity in the south west corner of Hellas. Best regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160715/CFs15July16.jpg>

**Clyde FOSTER** (Centurion, SOUTH AFRICA)

●.....*Subject: Mars - june 27th, 30th*

*Received: 2 July 2016 at 00:41 JST*

Hi Mr. Minami and All!, Here are my most recent observations from june 27th - influenced by Saharra dust aerosols and from the 30th under slightly better conditions.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160630/EMr30June16.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160627/EMr27June16.jpg>

○.....*Subject: Mars - July 2nd*

*Received: 3 July 2016 at 21:43 JST*

Hi Mr. Minami and All!, Here is my session of Mars on july 2nd.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160702/EMr02July16.jpg>

○.....*Subject: Mars - July 6th*

*Received: 7 July 2016 at 04:37 JST*

Hi Mr. Minami and All !, Here is my submission of my session on july 6th under below average conditions.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160706/EMr06July16.jpg>

○.....*Subject: Mars July 8,9,11,12,13th*

*Received: 14 July 2016 at 05:05 JST*

Hi Mr. Minami and All!, Here are my submissions from the following dates 8,9,11,12,13th under below/average conditions (Saharra dust aerosols).

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160708/EMr08July16.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160709/EMr09July16.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160711/EMr11July16.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160712/EMr12July16.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160713/EMr13July16.jpg>

**Efrain MORALES** (Aguadilla, PUERTO RICO)

●.....*Subject: Mars, 30th June*

*Received: 2 July 2016 at 19:08 JST*

Hi all, here is an image of Mars from a couple of nights back - generally poor seeing however some details can be seen, with clouds around the northern hemisphere at top left. regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160630/Aws30June16.jpg>

○.....*Subject: Mars on July 7*

*Received: 9 July 2016 at 10:18 JST*

Hi all, here's a 2-frame animation of Mars in IR taken on July 7. You can see some interesting detail around the Hellas basin at lower right. cheers,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160707/AWs07July16.jpg>

**Anthony WESLEY** (NSW, AUSTRALIA)

●.....*Subject: Mars - July 1, 2016*

*Received: 3 July 2016 at 03:17 JST*

Dear Masatsugu and Masami, Attached is a set of images of Mars I took on the morning of July 1. I struggled with poor transparency and passing clouds with these. I ended up using a luminance exposure for the final LRGB to get the best results for this night.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160701/WFI01July16.jpg>

○.....*Subject: Mars - July 4 & 5*

*Received: 6 July 2016 at 04:10 JST*

Dear Masatsugu and Masami, Attached are some of images of Mars from the mornings of July 4 and July 5. The July 5th image shows some interesting cloud formations on the eastern part of Mare Cimmerium. Also it's been interesting to follow the changes in the clouds over the north polar region. Best wishes,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160704/WFI04July16.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160705/WFI05July16.jpg>

**Bill FLANAGAN** (Houston, TX)

●.....*Subject: July 1, 2016*

*Received: 3 July 2016 at 12:33 JST*

Hi, I have attached my image of Mars July 1, 2016 at 1:41 UT. Thanks,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160701/FMI01July16.jpg>

○.....*Subject: Mars: July 3, 2016*

*Received: 7 July 2016 at 11:05 JST*

Hi, I am sending you my Mars images of Mars July 3, 2016 UT. Thanks,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160703/FMI03July16.jpg>

○.....*Subject: Mars: July 6, 2016*

*Received: 7 July 2016 at 11:07 JST*

Hi, I have attached my latest image of Mars July 6, 2016 at 1:43 UT. Thanks,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160706/FMI06July16.jpg>

○.....*Subject: Mars: July 11, 2016*

*Received: 12 July 2016 at 11:38 JST*

Hi, I have attached my latest image of Mars July 11, 2016 at 2:19 UT. Thanks,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160711/FMI11July16.jpg>

○.....*Subject: Mars: July 13, 2016*

*Received: 13 July 2016 at 13:09 JST*

Hi, I have attached my latest image of Mars July 13, 2016 at 0:46 UT. Thanks,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160713/FMI13July16.jpg>

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

●.....*Subject: Mars on 28th June and 1st July 2016*

*Received: 3 July 2016 at 22:48 JST*

Dear CMO/OAA-team! Here are my latest Mars observations from 28th June 2016 and 1st July 2016. On 1st July I used for first time my new ASI 290MM camera. I used WinjuPOS for combining the videos. best regards

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160701/RSz01July16.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160628/RSz28June16.jpg>

**Robert SCHULZ** (Vienna, AUSTRIA)

●.....*Subject: RE: Mars 2016/07/04 1644UT CM47*

*Received: 5 July 2016 at 06:59 JST*

Hi Clyde, Your last there image dates show very interesting cloud formations in the north polar regions! Ls 180 means beginning of Spring in Southern hemisphere and Fall in the Northern hemisphere. However, I think the sublimation of the CO<sub>2</sub> part of

the SPC may have started about Ls 120. I'm assuming the high straight line wind formations in Hellas were caused by sublimation. The clouds in the North may be part of the formation of the NPH. If anyone wants to comment on this stuff, please contact me. Thanks.

Good seeing,

**Jim MELKA** (Chesterfield, MO)

●.....*Subject: Mars July 5*

*Received: 5 July 2016 at 20:03 JST*

Tim Wilson, CM 170°, 1:40 UT July 5. 2016

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160705/TWI05July16.jpg>

**Tim WILSON** (Jefferson City, MO)

●.....*Subject: Mars2016 images from 02 and 04 July*

*Received: 5 July 2016 at 22:30 JST*

Attached are rgb images.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160702/GWk02July16.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160704/GWk04July16.jpg>

○.....*Subject: Mars2016\_14 July RGB image*

*Received: 15 July 2016 at 07:52 JST*

Relatively good seeing for altitude. Clouds in polar regions.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160714/GWk14July16.jpg>

○.....*Subject: More Mars 2016 images*

*Received: 15 July 2016 at 08:03 / 08:08 JST*

[http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/index\\_GWk.html](http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/index_GWk.html)

**Gary WALKER** (Macon, GA)

●.....*Subject: Mars 2016/07/03*

*Received: 7 July 2016 at 03:12 JST*

Hello, here is Mars in average conditions at 28 degrees altitude. SPH & NPH visible. Tharsis is cloud free.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160703/MKd03July16.jpg>

○.....*Subject: Mars 2016/07/06*

*Received: 8 July 2016 at 01:58 JST*

Hello, here is Mars in poor conditions at 28degrees altitude. Extended NPH is visible.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160706/MKd06July16.jpg>

**Manos KARDASIS** (Glyfada-Athens, GREECE)

●.....*Subject: Mars image - July 6*

*Received: 7 July 2016 at 13:00 JST*

Gentlemen, I am getting much better results with

the 180mm Mak-Cass. Seeing was good. Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160706/PGc06July16.jpg>

○.....*Subject: Mars image - July 7*  
*Received: 11 July 2016 at 05:46 JST*

Gentlemen, Seeing was less than average for this set of images. The blue channel is not well defined.

Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160707/PGc07July16.jpg>

**Peter GORCZYNSKI** (Oxford, CT)

●.....*Subject: Mars images*  
*Received: 7 July 2016 at 21:00 JST*

Dear Sirs, Please find attached a Mars image set from the 1st June 2016. Apologies for the late submission.

Best regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160601/MJs01June16.jpg>

**Mark JUSTICE** (Melbourne, AUSTRALIA)

●.....*Subject: Mars and Saturn 3rd July 2016*  
*Received: 8 July 2016 at 08:25 JST*

Hi, Some good seeing on 3rd July allowed reasonable imaging of Mars and Saturn both at ~17° altitude. Saturn in methane band too looking very strange.

See them also at;

<http://www.skyinspector.co.uk/mars-and-venus>

<http://www.skyinspector.co.uk/saturn>

All the best

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160703/MLw03July16.jpg>

**Martin LEWIS** (St Albans, the UK)

●.....*Subject: Mars images in May, June and July*  
*Received: 14 July 2016 at 18:11 JST*

Dear Dr. Minami, Most sorry for my long absence. This is my very first submission of the Martian images taken with my Meade 41cm Schmidt-Cassegrain in this apparition. Recent eye problems had forced me to turn from visual observation to digital imaging. I have been appreciating at first hand its advantages and difficulties. Seeing condition here has constantly been uncooperative with Mars'altitude as low as 30° at the culmination, Elysium area on the CM was nowhere on the Martian disk with my deteriorating eyes (I use Baader 60° BinoViewer), and it was rather sad to see clearly the fairly bright Elysium on the digital cam-

era's image in the display monitor of my PC. GOOD Seeing!

[http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/index\\_Kn.html](http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/index_Kn.html)

○.....*Subject: RE: Mars Reports*  
*Received: 16 July 2016 at 22:11 JST*

Dear Dr. Minami, All, I was astonished by the Damian PEACH's Barbados images on this 5 June. Compared to his Martian images in the last apparition, I think, his recent ones show remarkable improvement, they look most natural, almost artifact-free (especially for the 03:26:36 images) even at the zone very close to the limb/terminator area. His Barbados-based images are like a Missing Link between the HST's ones and the usual Earth-based ones. His images are most beautiful, but I believe he hasn't been aiming at making stunning final pictures, he must have concentrated on reproducing the red planet's lookings as unmistakably naturally as possible instead, thus he succeeded in re-creating the views of Mars which is originally beautiful.

Besides esthetics, hi-res natural Mars images are also very reliable in analyzing Martian climates. Damian's 5 June B image is surprisingly rich in detail showing H<sub>2</sub>O/CO<sub>2</sub> clouds/fogs, frosty areas, and the ground albedo differences as well; there within shortest wavelength range do exist subtle but significant differences in albedo on the Martian ground surface: please refer to the Christophe PELLIER's memorable fine article "Observing Red Surface on Mars in Violet Light"(CMO#375=ISMO#01, 25 August 2010) :

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn4/CMO375.pdf>

and also refer to my response to the article, LtE titled "Too normal violet image" dated Wed 15 Sept. 2010 (CMO#377) :

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn4/CMO377.pdf>

Checking carefully Damian's B image with comparing with the adjoining RBG one with the B light albedo features in mind, you can tell a lot of things...the bright tiny roundish patch south of Solis Lacus on the CM was the frosty crater Lowell, and the easterly neighboring same scale of whitish spot might have been the thinly frosted crater Douglass, ...

Ascræus Mons have started developing the summit cloud (Pavonis Mons might have also)... . And I believe we can read more precisely the dust-related activities provided we can compare with the individual G and B components. So, I do hope him always showing a full set, R, G and B images separately as well as the RGB one (adding UV and IR ones would make a powerful complete set!).

In the  $\omega=105^\circ\text{W}$  RGB image I have also noticed the explicitly yellow-greenish zone just inside off the dawn terminator. The adjoining B image suggests the desert area near the morning terminator to be rather free of clouds or mists. I guess the peripheral yellow-greenish tint can be the manifestation of the global abundance of airborne dusts. The longer light path through the atmosphere at the peripheral area of Martian disk may enhance the tint of airborne dusts; I guess the G component shows a "limb brightening".

Clear Skies with Good Seeing,

**Reiichi KONNAI** (Fukushima, JAPAN)

●.....*Subject: Mars images (June 5th.)*

*Received: 15 July 2016 at 23:54 JST*

Hi all, Here are some Mars images from June 5th. Solis Lacus/Tharsis/Chryse region on view. Some dusty streaks visible across Mare Acidalium. Note the bright patch on the SPC boundary - i wonder if this is a frosted crater? Possibly Lowell?

<http://www.damianpeach.com/mars1617/m2016-06-05-RGBall.jpg>

[http://www.damianpeach.com/mars1617/m2016-06-05-0326\\_6-BLUE.jpg](http://www.damianpeach.com/mars1617/m2016-06-05-0326_6-BLUE.jpg)

Best Wishes

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160605/DPc05June16.jpg>

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

●.....*Subject: RE: Mars Reports*

*Received: 16 July 2016 at 05:55 JST*

Dear Richard, Thank you very much for your kind email dated 10 July. I am sorry I have been late in replying because I have been quite absorbed in writing and editing CMO No. 451 whose completion was also in four days late. As you know I am already 77.5 years old, and my usual motion/action has become very slower, and the amount of my possible workload per day is quite limited. Since the time I fell down in

the middle of the 2012 apparition, I have not been able to observe the planet Mars as a routine work (I was diagnosed with Parkinson's disease, so that I was prohibited from driving a car to the Observatory). Furthermore I think I am suffering from Dementia MCI, and hence it is sometimes difficult to refer to some old but important data and/or theories. Nomenclature, date, spell and so on are always difficult problems.

So I have not written so much after 2012 about Mars, and perhaps Part I and Part II of my personal records of Mars observations in 2005 are the last. I am sorry I have no reprints so that I cannot send paper versions to you. But they were published as PDFs:

<http://www.nature.museum.city.fukui.fukui.jp/shuppan/kenpou/60/60-1-10.pdf>

<http://www.nature.museum.city.fukui.fukui.jp/shuppan/kenpou/62/62-1-12.pdf>

These are shown up if you click the titres in the icon Mars@Fukui on r.h.s. corner of the Façade of the CMO/ISMO: <http://www.mars.dti.ne.jp/~cmo/ISMO.html>

I am also planning to write the final Part of the 2005 Mars at the end of this year to publish from the Fukui City Museum of Natural History.

We have also an intention to write about our 2007/2008 apparition at the end of the next year if both of Nakajima and I continue to be alive (Nakajima also fell down in the same year as me: He suffers from Diabetes, and so retired even from any serious work of the CMO.)

I don't think I have my future so much, but if I can spend 2017 (without Mars) safely, I would like to write a few numbers of assertions, claims, arguments in forms of articles about Mars. In that case, I will leave or send my messages to you.

I like the BAA Memoires on Mars (though I don't have more than a few copies). I hope you will continue to record important documents as a BAA archivist. You are younger by more than 20 years than me or the late Don Parker. So you have much work before you for the sake of the coming Mars observers.

To keep the documents more than one hundred years, we should like just to advise you that the chemical age of the CDR is quite shorter: maybe 3~10 years. Even concerning the true CD we hear it is

shorter than 70 years. In an ironical sense the recent paper version looks more stable. I suppose the British people are cleverer in keeping Books: When I stayed in the Imperial College, its Library did not have any collection of the Japanese journals of theoretical physics called PTP="Progress of Theoretical Physics" (ever since 1946, published by the Yukawa Hall, Kyoto University), while I found that the Library of the Natural History Museum London, which is quite near the Imperial College, was keeping their whole volumes of PTP from 1946. I was moved to see that every volume was in a solemn binding (in a British way).

I also suppose such a house of the Burlington House keeps a good library.

Here I hope you will permit me to digress, since this digression may suggest a hint to the Archives Problem: Now, unfortunately, the PTP terminated in 2012 (ten years after my retirement) and merged into newly PTEP (E=Experimental). At present PTP Archives and PTEP seem to be under the control of the Oxford University Press. Anyway, since it is said Oxford Univ Press controls the PTP Archives, I so tried to find my paper written 43 years ago by following the instruction, then really

<http://ptp.oxfordjournals.org/content/50/6/2027.full.pdf+html> produced my paper on line.

Another paper is also easily (freely) found:

<http://ptp.oxfordjournals.org/content/52/3/1031.full.pdf+html>

By the same token I could further find thirdly more interesting paper in oxfordjournals.org

<http://ptp.oxfordjournals.org/content/59/5/1709.full.pdf+html>

I suppose these are not interesting to you at all, but these three are selected from my article ("At most 5%") in CMO#412, and so interesting to me. On the other hand, I am writing this because this may suggest that it is a good way to the Archive on line. At least, it works for 40 years if the Oxford University Press.org is alive. (On the other hand the URL used in CMO #412 seems useless now-- we must change URLs soon--. This is one of the troubles we encounter when we are concerned with the online system.) However these technical problems will be easily solved. And it

will be wonderful if we from the outside of Britten become able to make access to any page of the BAA Memoire and other BAA Archives online.

Finally I hope you will soon complete the 2010 opposition report. We are much behind you, since the 2007/2008 apparition may be undertaken in 2017 at the earliest. With best wishes,

**Masatsugu MINAMI** (ISMO; Fukui, JAPAN)

○.....*Subject: Re: RE: Mars Reports*  
*Received: 20 July 2016 at 20:41 JST*

Dear Masatsugu: Thanks very much for your reply, and for the links to your paper on 2005 which I had not previously seen. I was certainly aware of your health problems and I did not want to bother you unduly.

The long term storage of documents is problematic for sure. I also do not trust CDs, but they are certainly useful for quickly sharing data, such as for the BAA project I outlined to you. The irony is that those books made from rags well before the Victorian era have survived much better than those printed on the cheap paper from that later time.

As to putting archives online, it is certainly an intention, but I think it will be a long way off, for all of us in the BAA have to work on our reports in our spare time, and we have no time left over. But the Variable Star Section have all their data online now, perhaps because they are simple numerical data.

I am working hard on the final 2010 Mars report. I also wrote the draft of a paper on the calculation of the height of a terminator projection on Mars, one for the RAS journal about the role of women in the early years of the BAA, and the first biography of the famous observer and microscopist A.A.C.Eliot Merlin. The Saturn reports are steadily appearing in the Journal. All good wishes,

○.....*Subject: Re: RE: Mars Reports*  
*Received: 20 July 2016 at 20:41 JST*

Dear Masatsugu, Thank you very much indeed for sending the powerpoint and the other document. I had not seen part 2 of your 2003 paper, but now I can find it online I will certainly review it together with

the 2005 papers. The 2003 projections I remember well, and I observed a significant one myself that year, which lay to the west of Hellas and which was part of the large Regional dust storm that occurred as Beagle 2 was heading towards a landing (details as published in the BAA Section report).

Because these terminator projections have occurred both alone and (occasionally) as part of the larger dust clouds, I had always assumed they must be dust. The enormous height of the 2012 event is certainly a problem, and your suggestion regarding both the 2003 and 2012 phenomena is certainly a clever one. I do not know if the energy source is sufficient or not, as it is beyond my specialist field, but I will certainly be looking into it. I suppose the idea could be tested by looking at other examples (of which we could easily find several) and correlating them with the observations of the particle flux from the Sun.

In my planned paper on the terminator projections I merely wanted to derive the mathematical formulae for finding the height from the image or drawing, and to show that the calculation is actually very simple. No mechanism for raising the terminator projection was discussed. I have seen very complex calculations published, and it is really not necessary to complicate matters (as you must know, having measured the 2003 event!) unless one uses a different coordinate system.

It is possible this paper may in the end form an Appendix to the 2012 report. At present I am not sure, and of course the 2012 report is going to be some way off. Antoniadis published another, graphical, solution in an Appendix to one of the old Mars Memoirs, and repeated it in his Mars book. It is very hard to follow, and I know I am not alone in that belief. Have you seen that one? With all good wishes

**Richard McKIM**

(Director, the BAA Mars Section)

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#### Notices from CMO/ISMO Fukui/Yokohama:

- 1) Let's announce that the "kwasan" server will not be available for 5 hours from 04h to 09h GMT on 4 August 2016 for the sake of maintenance.
- 2) We hope every Mars observer in Japan and Australia would like to check the flash phenomenon which may occur at Edom Promo on 6 August 2016 when  $(DE+Ds)/2=2.11^{\circ}N$  during the time period from 10:45 GMT to 11:25 GMT: (LCM will be from  $\omega=002^{\circ}W$  to  $\omega=012^{\circ}W$ ). Another sophisticated case may occur on 25 August 2016 during the time from 21:20 GMT to 22:05 GMT. This case will be favourable for the observers at the East Coast of the US. For further information, ask [cmo@mars.dti.ne.jp](mailto:cmo@mars.dti.ne.jp)
- 3) There will be no issue of the CMO/ISMO on 10 August 2016.

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## International Society of the Mars Observers (ISMO)

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**CMO n°452/ ISMO #78 (25 July 2016)**

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



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