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2016 CMO/ISMO Mars Observations Made During the Fortnight Period from 16 June ($\lambda=170^\circ\text{Ls}$) to 30 June ($\lambda=178^\circ\text{Ls}$) 2016

♂..... We shall here give the 11th CMO/ISMO 2016 Mars Report dealing with the ISMO observations made during the fortnight period from 16 June until 30 June 2016. The planet Mars first continued to retrograde inside the Libra constellation, but its motion became slow and finally "stationary" on 30 June, and then moved forwards. The apparent declination D was around 21°S , without much variation and the latitude of Mars remained very low seen from the terrestrial northern hemisphere. The angular diameter went down from $\delta=17.9''$ to $\delta=16.3''$, but still was larger than the largest diameter in the preceding 2014 apparition $\delta=15.2''$. The Martian season proceeded from $\lambda=170^\circ\text{Ls}$ to $\lambda=178^\circ\text{Ls}$, up until quite near the southern vernal equinox $\lambda=180^\circ\text{Ls}$. The central latitude ϕ was a bit tilted around $\phi=15^\circ\text{N}\sim 16^\circ\text{N}$ but too northern and it looked far from for us to meet the opportunity to catch the appearance of the south polar cap (spc). However Marc DELCROIX (MDC) from France issued a nicely processed RGB image made on 21 June ($\lambda=173^\circ\text{Ls}$) whose R image gave us to measure the size of the spc, and we found that MDC's images suggested the usual big size with the appropriate snow line (see NB below). One of the present writers (Mn) experienced in 2003 on 17 April when $\phi=14^\circ\text{S}$, $\delta=8.4''$, $\lambda=170^\circ\text{Ls}$ to witness the shadowy depression at the centre of the spc. This was observed very frequently after $\lambda=180^\circ\text{Ls}$: That implies at this season the southern circumpolar region of the planet is first warmed up from the polar central area. The peripheral marginal area of the spc at this season however is full of the H_2O condensates or ices which glare as were often visually observed as earlier as in 1971 by Reiichi KONNAI (for example on 10 August 1971 when $\lambda=232^\circ\text{Ls}$, $\phi=15^\circ\text{S}$, $\delta=24.9''$). So the peripheral circumpolar region should be chased to be much observed (and carefully processed) until the latter part of this apparition (for example, $\lambda=232^\circ\text{Ls}$ will be attained on 29 September 2016 with $\phi=1.5^\circ\text{S}$, $\delta=8.9''$). We note also here that at the arctic deep region, the weather has been observed to very dismal. The north polar hood (nph) has been considered to be formed during the season $\lambda=160^\circ\text{Ls}\sim 185^\circ\text{Ls}$, and hence the present season is inside. It is hoped the arctic clouds should be trapped in a smooth description with a rich gradation. Quite a few are made of the water vapour, but in the cases of the 1999 MOC observations (due to the investigation by Bruce CANTOR et al) it was pointed out that the arctic dusts occurred at $\lambda=163^\circ\text{Ls}$ and at $\lambda=184^\circ\text{Ls}$ at the places ($\Phi=75^\circ\text{N}$, $\Omega=323^\circ\text{W}$) and ($\Phi=69^\circ\text{N}$, $\Omega=310^\circ\text{W}$) respectively. If the interaction of the H_2O cloud and dust cloud could be caught, those observations would be precious as fundamental data.

♂..... This period, we have received a total of 75 observations from 21 observers. Regrettably the observations from Melbourne and its neighbourhood have decreased this period perhaps because of the monsoon-like weather. The observers who contributed this period are listed as follows:

AKUTSU, Tomio (Ak) Tochigi, JAPAN (* Utsunomiya University Observatory)

2 RGB Colour + 2 B + 2 IR Images (18*, 21 June 2016)
36cm SCT, 40cm Cassegrain* with an ASI174MM & ASI224MC

CARDINALLI, Francisco Alsina (Fcd) Oro Verde, ARGENTINA

1 IR Image (19 June 2016) 25cm SCT with a QHY5-II

DELCROIX, Marc (MDc) Tournepuile, FRANCE

1 Set of RGB + 1 IR Images (21 June 2016) 32cm Spec with an ASI290MM

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

2 Sets of RGB Images (16, 17 June 2016) 36cm SCT @f/17 with a PGR GS3-U3-32S4M-C

FOSTER, Clyde (CFs) Centurion, SOUTH AFRICA

10 Colour + 10 IR Images (16, 18, ~20, 22, 24, ~27, 30 June 2016) 36cm SCT @f/33 with an ASI224MC

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

4 Sets of RGB + 2 IR images (17, ~19, 25* June 2016)
18cm Maksutov Cassegrain, 36cm SCT* with an ASI290MM

HERNANDEZ, Carlos E (CHr) Miami, FL, the USA

1 Colour Drawing (17 June 2014) 23cm Maksutov-Cassegrain, 260x, 390x

ISHIBASHI Tsutomu (Is) Sagamihara, Kanagawa, JAPAN

4 Colour Images (18, 21 June 2016) 31cm Spec, with a SONY HC9 Video Cam

KARDASIS, Manos (MKd) Glyfada-Athens, GREECE

1 Colour Image (16 June 2016) 36cm SCT with a DBK21AU618

KUDOH Hidetoshi (Kd) Cairns, QLD, AUSTRALIA

1 Colour Image (22 June 2016) 20cm Spec with a QHY5L-II-C

KUMAMORI, Teruaki (Km) Sakai, Osaka, JAPAN

4 LRGB + 4 B Images (18, 21, 23, 26 June 2016)
36cm SCT @ f/30, 38 with an ASI224MC & ASI290MM

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

11 Colour Images (17, ~21, 23, 25, 26 June 2016) 25cm SCT with a ToUcam pro II

MORALES RIVERA, Efrain (EMr) Aguadilla, PUERTO RICO

9 Sets of RGB Images (16, 17, 19, 23, 25, 26, 27, 30 June 2016) 31cm SCT with a Flea 3

MURAKAMI, Masami (Mk) Yokohama, Kanagawa, JAPAN

3 Drawings (21 June 2016) 320x 20cm (F/8) Spec

OHSUGI, Tadao (Og) Komatsu, Ishikawa, JAPAN

4 Colour Images (17, 18, 26, 30 June 2016) 25cm Dall-Kirkham with an ASI290MC

SCHULZ, Robert (RSz) Vienna, AUSTRIA

4 Colour Image (21, 23*, 28 June 2016) 20cm SCT, 30cm Spec (**Jürgen STÖGER**)* with an ASI224MC

WARELL, Johan (JWr) Lindby, Skivarp, SWEDEN

2 Sets of RGB Images (18, 21 June 2016) 22cm speculum @f/30 with a DBK21AU618

WESLEY, Anthony (AWs) NSW, AUSTRALIA

5 Colour Images (21, ~23, 29, 30 June 2016) (51cm Spec with a PGR GS3-U3-32S4M)

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

1 Colour + 4 B + 8 IR Images (18, 19, 22*, 26, 28 June 2016)

28cm SCT with an ASI120MM & ASI120MC*

♂.....We further received the following three observers several observations made during earlier periods.

BUDA, Stefan (SBd) Melbourne, AUSTRALIA

1 Set of RGB Images (31 May 2016) 41cm Dall-Kirkham with an ASI120MM

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

1 Colour Image (8 June 2016) 44cm Spec with an ASI174MC

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

4 Sets of RGB + 3 RGB Colour + 7 IR Images (24,~ 30 May 2016)

25cm Dall-Kirkham with an ASI290MM

♂.....We now begin to touch briefly on each observation received (by the dead line) chronologically:

16 June 2016 ($\lambda=170^\circ\text{Ls}$, $\delta=17.9^\circ\text{--}17.8^\circ$, $\varphi=15^\circ\text{N}$)

Efrain MORALES (EMr) observed at $\omega=001^\circ\text{W}$. This looks like a routine work, and did not chase the dust found by himself on 15 June. There is seen a bit of trace of dust to the west of Neudrus, but the cloud patch condition of the coming Eos to Xanthe suggests a need of further chases. The northern region from the northern part of M Acidalium to the arctic limb is interestingly overcast since 13 June. The south polar hood (sph) looks very whitish bright.

Bill FLANAGAN (WFI) gave timely an important image at $\omega=034^\circ\text{W}$: This image gives us a piece of information about the dusty aspect at the area from Neudrus to Auroræ S together with some detailed description of the minor markings. The dust goes down through Eos Chasma to Hydraotes Chaos (0.8°N , 35.4°W). The other branch of dust at Coprates Chasma looks to stay in a way similar to the preceding day, and the area is thickest at Eos Chaos (16.6°S , 46.9°W). As experienced in 2005, Auroræ S appears human-shaped if Coprates Chasma is filled with the bright dust. And Auroræ S shows a couple of protruding legs downwards (and one "hand" at Juventæ Chasma): The western leg includes the Mutch crater and the eastern leg does the Orson Welles crater (refer to the Google Mars). This human shape is also apparent on the present RGB, as well as on R&G images given by WFI. On this day Juventæ Chasma was free from the dust (while in 2005, as previously shown on WFI's image on 19 October 2005, Juventæ Fons was invaded by the dust), but the dust looks to have farther arrived at around Hebes Chasma (01°S , 076°W). Note further that the area to the east of Neudrus double canals shows a sandy colour. The weather at the northern district from M Acidalium to the arctic deep area looks very rough, and the residual north polar cap (npc) does not show up. It is somehow difficult to describe, but the peripheral part of the sph/spc shows an impressive small spiral cloud with a dark hole inside, which is conspicuous in G and B.

Clyde FOSTER (CFs) gave his usual L-colour image at $\omega=233^\circ\text{W}$. Syrtis Mj is near the morning terminator, but does no longer show any bluish tint. Elysium is located at the afternoon side but does not white colour at Elysium Mons. Phlegra looks split into two as in the 2001 case when the area was covered by the global dust storm. The residual npc is a bit visible but overcast by a complex haze. Ausonia Aus-

tralis looks reddish. The sph/spc should be whiter.

Manos KARDASIS (MKd) shows a DBK image at $\omega=258^\circ\text{W}$. It looks a bit blurred, but detailed. The npc is indefinite, but looks to send a misty protrusion southwards. At the evening limb, to the north of Propontis I, a white cloud is visible. The sph looks covering a vast area, but the brighter part is not so whitish.

17 June 2016 ($\lambda=170^\circ\text{Ls}$ ~ 171°Ls , $\delta=17.8''$ ~ $17.7''$)

Carlos HERNANDEZ (CHr) elaborated a colour drawing at $\omega=329^\circ\text{W}$. An evening limb haze covers the limb area around the evening Hellas to the extent that the breadth of the sph/spc cannot be identified, and a part looks go down to Syrtis Mj. The npc seems to be shown.

EMr made two sets of images at $\omega=342^\circ\text{W}$ and at $\omega=002^\circ\text{W}$. The latter image corresponds to his image on the preceding day. The trace of the dust is checked on the second image but it seems that the trace is not suspended and may suggest a fallout of dust on the ground (from Neudrus down to Eos) even including the partial area of S Meridiani. The area of Coprates Chasma is unfortunately out of scope. Both RGB sets show that the northern district from 53°N to the arctic area is beneath quite a hazy weather condition: The npc is not detected. The sph/spc is very whitish bright, though peripheral part is not clear cut but shows some blurred outskirts.

Peter GORCZYNSKI (PGc) made an RGB set at $\omega=349^\circ\text{W}$. The dusty site in question is leaving a taste of dust occupation. Area around Eos looks the same as WFI described on the preceding day. The sph/spc has a white core.

Frank MELILLO (FMI)'s image is at $\omega=352^\circ\text{W}$. The trace of dust is checked though weak. The arctic clouds look weak. The sph/spc is more evident.

WFI gave an excellent RGB image at $\omega=024^\circ\text{W}$. The area between the Neudrus double canals is reddish. Its eastern neighbour shows a dusty tint. Apparently S Meridiani received an influence of dust. The west of Neudrus shows an aspect similar to the one on the preceding day, and the distribution of dust at Coprates Chasma looks similar, but slightly more diffused, and the northern part of Auroræ S appears to be a bit dusty. The most apparent area of the dust stream remains similar and is found at Eos Chaos. The spiral cloud at the peripheral part of the sph/spc moved outside and became weaker. The arctic region is largely occupied by a mixture of condensate clouds and hazes. The npc does not show up though $\phi=15^\circ\text{N}$.

Tadao OHSUGI (Og) gave an image at $\omega=119^\circ\text{W}$. The site in question is out of scope. It is apparent that the arctic large region is quite hazed, but the present contrast does not reproduce the distribution of the varieties of the polar clouds. The image is colourless in general.

18 June 2016 ($\lambda=171^\circ\text{Ls}$, $\delta=17.7''$ ~ $17.6''$)

PGc's RGB image is at $\omega=338^\circ\text{W}$. The area in question is gone away. Hellas is near the evening limb in sandy colour. Hellas is independent of the sph/spc which is whitish bright. It seems that the NS axis is

not set perpendicular. We hope every observer tries to find the NS axis by the method employed by Don PARKER (and by Yukio MORITA). If any observer neglects this setting, he will not be able to chase the forthcoming deviation of the centre of the spc from the southern geometrical pole.

Tim WILSON (TMI) lined up several images, especially an IR807 image at $\omega=342^\circ\text{W}$ as well as a B image at $\omega=340^\circ\text{W}$. We are sorry however we don't understand his intention.

FMI provided two colour images at $\omega=342^\circ\text{W}$ and at $\omega=009^\circ\text{W}$. The range of the dust in question is included in the second image, but there appears little definite detail. Both images suggest well the inclement weather at the arctic region. The NS axis does not look perpendicular.

Tomio AKUTSU (Ak) made use of the Utsunomiya University Observatory to obtain an RGB at $\omega=098^\circ\text{W}$. The east of Agathodæmon shows an unusual aspect at the evening limb, but does not capture the dust. The hazy condition at the arctic region is somewhat shown.

Teruaki KUMAMORI (Km) obtained an L-colour and a B image at $\omega=103^\circ\text{W}$. Km suppressed the enhancement of the dark marking on the L-colour image, and emphasised the limb haze which is also shown well on the B image. The arctic area is inside the haze as well as the M Acidalium area, though a tail part of the latter appears exceptionally dark. Notable is that the preceding limb of Solis L is quite less misty, though the preceding limb area of Auroræ S is very whitish hazy. The sph/spc is not conspicuous.

Tsutomu ISHIBASHI (Is)'s image is at $\omega=109^\circ\text{W}$. On the other piece made use of the maximal entropy method shows more nicely Ophir and its eastern evening mist.

Og gave quite a rough image at $\omega=115^\circ\text{W}$. The representations of the sph and the npr are weak, while the dark markings are strongly (wrongly) featured.

CFs gave an L-colour and an IR image at $\omega=197^\circ\text{W}$ and so on. It appears that the spc is visible but does not look white, but off-whitish. There are found a couple of small pinkish dust devils between the tail of M Cimmerium and the head of M Sirenum. The ring of Olympus Mons with the jade-greenish centre is visible near the evening limb. The area near the northern limb shows an npc-like white segment. It is hard however to say something about it because a long limb-ghost governs around there.

Johan WARELL (JWr)'s RGB image is at $\omega=246^\circ\text{W}$. The colour looks too unstable.

19 June 2016 ($\lambda=171^\circ\text{Ls}\sim 172^\circ\text{Ls}$, $\delta=17.6''\sim 17.5''$)

EMr gave an RGB at $\omega=315^\circ\text{W}$. It is normal that the arctic region is suffering from the roughness of the weather condition, while it is surprising to see the whiteness inside Hellas. The southern limb looks blurred in R and G. Furthermore the evening limb side is not well processed. Even then Hellas looks abnormal. The latitudes of Deucalionis R look also covered by dusty matters, though the Huygens crater is clearly seen. Where is the sph?

TWI gave an IR and a B images at $\omega=332^\circ\text{W}$. The B image shows a bright Hellas near the evening limb.

FMI's single colour image at $\omega=335^\circ\text{W}$. Hellas is near the evening limb, and whitish bright. The roughness of the arctic weather is apparent (detailed?). The NS axis is dubious.

PGc obtained an RGB composite at $\omega=338^\circ\text{W}$. The npc is a bit seen? The sph is appearing. Hellas is beneath the evening haze but there is seen a pinkish streak along the western wall of Yaonis Fr. The Huygens crater is visible, and the morning Margaritifer S remains as usual.

Francisco Arsina CARDINALLI (FCd) gave an IR742 image at $\omega=010^\circ\text{W}$. Any single IR image does not bring about so much, but this may still show the sign of the dust filled Coprates Chasma. Both of the polar regions are quite shadowy.

CFs gave an L-colour image at $\omega=205^\circ\text{W}$ and so on. The couple of the dust balls observed on the preceding day were vanished to make a fallout area around at $\Omega=190^\circ\text{W}$.

20 June 2016 ($\lambda=172^\circ\text{Ls}$, $\delta=17.5''\sim 17.4''$)

FMI took a single image at $\omega=319^\circ\text{W}$. The evening limb side is largely whitish hazy. It is not easy to identify the position of Hellas, but it must be partly whitish. The sph does not look isolated. There is seen a strong white cloud pillar standing straightforwardly from the area of the npc.

CFs's main image is a large L-colour one at $\omega=196^\circ\text{W}$. The arctic region is largely overcast by the spread of several thinner hazes. Among them, near at the bottom, there is outstandingly visible a small cloud patch upon a dark segment. The npc is however not identified (as far as any limb is associated with a ghost arc line, we should keep silent about a delicate limb affair). The sph is also at the limb side, but the area is well whitish. The eastern tail of M Cimmerium has a few discrete dust spots near M Sirenum. There may be a dusty light area at the following M Sirenum. Olympus Mons's ring is visible near the evening limb with a cloud. The inside of Elysium is interestingly detailed including shadowy area preceding Elysium Mons.

21 June 2016 ($\lambda=172^\circ\text{Ls}\sim 173^\circ\text{Ls}$, $\delta=17.4''\sim 17.3''$)

FMI gave two colour images at $\omega=300^\circ\text{W}$ and at $\omega=310^\circ\text{W}$. The colour is a bit duller, but there is seen the whitish sph at the southern limb, and a part of it looks to invade Hellas. The arctic area is also quite hazed. Syrtis Mj remains dark. The western end of Utopia and Boreosyrtis are visible separated.

Masami MURAKAMI (Mk)(one of the present writers) visually observed the planet by the use of 320×20cm Newtonian, three times every 40 minutes at $\omega=070^\circ\text{W}$, $\omega=080^\circ\text{W}$, $\omega=089^\circ\text{W}$. At $\omega=070^\circ\text{W}$, the seeing condition was 2~3/5: The aspect of Coprates Chasma was unclear. The sph looked a bit off-whitish though the morning side and the evening side are brighter. Ophir is light but Ganges is low in density. M Acidalium appeared also less dark. The arctic area is covered by a blue-whitish haze. At $\omega=080^\circ\text{W}$, the planet came near the meridian. Mk judged that the bright thing at the southern limb was the spc. The evening limb is also whitish. At $\omega=089^\circ\text{W}$, the spc was convincing. Solis L has a density, but M Acidalium

is weak. The bright Ophir and the old Tharsis were together bright in a V shape. Ceraunius divided Tempe and Arcadia. The arctic area is seen hazy light. The seeing went down.

Is made three images at $\omega=080^\circ\text{W}$, $\omega=089^\circ\text{W}$, $\omega=099^\circ\text{W}$. Among the three, the one at $\omega=089^\circ\text{W}$ is the best. Solis L is the darkest and to the south of it the sph/spc makes a brighter part. Ophir is light distinguished, and Tithonius L is checked. The arctic area is hazy light. The NW part of M Acidalium is a bit darker. At $\omega=080^\circ\text{W}$, we may say something about the area of Auroræ S, but maybe impossible because the image is too coarse.

Km's main image is at $\omega=095^\circ\text{W}$. The colour image impressively shows the deep evening haze covers the preceding limb side. This is the tendency which has been seen after the airborne dusts prevailed. An NW part of M Acidalium escapes however the haze (as well as the arctic haze). Also the preceding limb side of Solis L looks to be free from the whitish haze (maybe differently covered by something else). The sph/spc is blue-whitish, but it looks declined a bit to the morning side. On the opposite side, the npc looks to stay at the bottom. If this is so, the sph/spc must surely be declined. However on the associated B image, the sph looks to stay at the top, while the npc is unknown. Any way it is always to fix the NS axis perpendicularly.

Ak made an observation at home at $\omega=102^\circ\text{W}$. The RGB image shows well the marginal haze, but the image itself looks coarse.

Anthony WESLEY (AWs) gave a large image at $\omega=105^\circ\text{W}$. The sph is whitish, but not definite and looks to send out some whitish fringe (maybe water vapoured). The depth of the sph is narrow, while the width is wider. On the opposite side, there is something like the npc near at the bottom. The arctic haze, not uniform, largely covers the arctic large region to the north of 42°N . If we extend the line which connects the npc-like matter with Claritas Rupes at $\Omega=105^\circ\text{W}$, the line passes the centre of the sph, and hence if we believe in the fairy-tale-like tale, the so-called sph should be the true spc. This image is also important because, in it, Coprates Chasma is detailed. The description inside the disk is also excellent: The donut ring at Fortuna, Tharsis Montes, the annular ring of Olympus Mons are nicely shown.

JWr gave an RGB image at $\omega=219^\circ\text{W}$. The colour of the dark markings are however too greenish. The white matters at the both polar areas look better.

Robert SCHULZ (RSz) obtained an RGB image at $\omega=228^\circ\text{W}$. The planet just shows in Wien an altitude of 21° high, and hence the image is less definitive. But the brightness of the top white may imply the spc's own.

Marc DELCROIX (MDc) obtained a pretty set of three RGB ingredients to give an excellent RGB composite at $\omega=234^\circ\text{W}$ (plus a too-enhanced IR image at $\omega=226^\circ\text{W}$). The markings on the composite look a bit dimmer, while the surface has been moderately processed to show deep chroma gradation. The desert region on the R ingredient is not just smooth but shows a rich shaded nuance to the extent that the reddish deserts in R turned out to show depths in colour and in a variety of density. In short, we consider

that the expression of the deserts is fully corporeal and it was reflected on the chromatic description of the deserts on the RGB composite. Furthermore the south polar canopy in R and G is shows a clear presence, and hence we would like to regard the canopy as no less than the npc.

N.B.: Since MDC's images on 21 June appeared to us as if their images-procedures, especially their finishing touches were excellent in an unprecedented way, we tried to figure out the size of the spc at the season $\lambda=173^\circ\text{Ls}$. Thirty years ago, another of the present writers (Mn) checked the formulae in the cases 1) where the spc is completely inside the disk, and 2) when the southern perimeter of the spc is outside the disk while the geometrical south pole is inside the disk (see CMO n°003, 25 February 1986 issue). This time, the case is quite new because the geometrical pole is away concealed on the opposite rear side, and the depth d of the spc on the image seen from this side which we can catch must be no more than a few millimetres even if we choose a 10cm disk (or if we choose the radius r to be about 5cm). Anyway, as the formula for the case 3) we propose the following form:

$$\cos(\psi - |\phi|) = 1 - (d/r),$$

where ψ is the central angle of the spc, ϕ is the tilt DE. Then the snow-line is found at the latitude of $(90 - \psi)^\circ\text{S}$. As Mk this time tried to estimate the edges on MDC's R images on several cases (on monitor, on the printed paper, ...) to find that the snow-line falls within the interval $(53^\circ\text{S} \sim 56^\circ\text{S})$ by the use of the above formula. This is a bit different than the value 58°S we expected at $\lambda=173^\circ\text{Ls}$. However we now know that MDC's R image suggests a normally large spc, and vice versa we decided that this is very the south polar cap.

We finally note that as is widely known the composition of the spc is different from that of the npc, and usually said as if the spc is totally made of the CO_2 condensate, but this is not always satisfactory. As was shown by VO2, the albedo distribution of the spc at $\lambda=176^\circ\text{Ls}$ shows a peak at the marginal part at the latitude around 60°S . The fact that the peripheral part of the spc is much brighter than the central area was also known to the visual observers and reasoned because of the H_2O condensates at the peripheral zone of the spc. We so consider that the marginal H_2O condensate will bring about a phenomenon sometimes which sends out the water-vapour mist towards the outskirts.

22 June 2016 ($\lambda=173^\circ\text{Ls} \sim 174^\circ\text{Ls}$, $\delta=17.3'' \sim 17.2''$)

TWI put forwards several images: Among them, we pick out the 120MC colour image at $\omega=304^\circ\text{W}$, and a B image at $\omega=300^\circ\text{W}$. The colour image is not yet sufficient because the spc is not so whitish and shows a chromatic aberration. The B image is good in showing an arctic morning thick cloud.

Hidetoshi KUDOH (Kd)'s is at $\omega=071^\circ\text{W}$ from Cairns: The dusty Coprates Chasma area to the ES of Auroræ S is visible, but the dust has been weakened and its distribution has slightly changed. Part of Auroræ S near Orson=Welles crater looks diffused. On the morning side, the donut-type light ring at Fortuna is very clearly seen, and Tharsis Montes are visible among which Ascraeus Mons is the darkest. If Kd could try to take another set 40 minutes later, he could have caught Olympus Mons more clearly. The present image suggests us to pay attention to the details of Nilokeras. The distribution of the misty clouds at the arctic region is nicely shown. The bright partially spc is caught, but we hope the observer could try to fix the NS axis exactly.

AWs's image is at $\omega=075^\circ\text{W}$. The preceding side is largely covered by the thicker airborne dust. It looks like the southern dark markings are all dusty including Solis L. Aurea Cherso is blurred, while every element of Tithonius L is clearer. Remarkable is that the previous dust which filled Coprates Chasma has already been dissipated and/or has spread out around there. It is thought thus that the dust disturbance ever since 15 June has gradually contaminated the region preceding Ganges. Ganges keeps the original colour, and to the west of Ganges, the doughnut light area and the Ascræus ridge look very clear. Some arctic clouds are interestingly depicted. The spc has a jutting-out part from the peripheral margin of the spc and it clearly shows a small half spiral cloud as was observed by Bill FLANAGAN (WFI) on 16 June ($\lambda=170^\circ\text{Ls}$) at $\omega=034^\circ\text{W}$.

CFs's L-colour image is at $\omega=155^\circ\text{W}$. Notable are a couple of dusty spots with some surrounding dusty fainter areas to the south of the following part of M Sirenum: These remind us of a pair of dust spots observed by CFs on 18 June. The width of the spc along the limb is not definite, but the central area is whitish. Tharsis Montes are slightly cloudy: Ascræus Mons's is thicker. The arctic region is largely overcast up to Propontis I.

23 June 2016 ($\lambda=174^\circ\text{Ls}$, $\delta=17.2''-17.1''$)

EMr's RGB image is at $\omega=285^\circ\text{W}$. Fine finish is this RGB: It is good to emphasise the floating matters without adhering to the details of markings. The spc is definite, and the H₂O condensate at the edge of the spc must have been brought down to the area of Hellas as a water mist (also evident on B). This must be subjected to the diurnal change of meteorological condition. Ausonia Australis is still red-dish beneath the mist. Central part of Utopia is overcast by an arctic thick cloud. The Elysium cloud is not so thick even near the evening limb.

FMI gave several decomposed images at $\omega=295^\circ\text{W}$. The decomposition must be meaningless because Syrtis Mj is usually dark in so-called B. The spc area is not well mapped.

AWs gave again a big excellent image at $\omega=067^\circ\text{W}$. This picture may imply that the dust disturbance onset on 15 June must have done nothing further than to increase the increase the airborne dust trouble. Above Coprates Chasma there seems to remain suspended a dust condensate or water-vapour condensate, and the human shaped marking on Auroræ S including Xanthe Terra does not make the form at present. On the surface, Ganges and the area around Fortuna are free from the dust or the mist, and M Acidalium is dust/misty faint. The arctic region is largely overcast, but the cloud is not uniform in density. The spc is not well edged. Maybe the water mist is showing a potential to constitute a spiral. There is a cloud to the south of Solis L and to the north there lies a broad cloud belt. Aurea Cherso is a bit more visible (than on 22 June). It is possible the summit of Ascræus Mons is more apparent than usual because of the dusty/misty lower expansion.

Km imaged the surface defiled with dust/haze at $\omega=073^\circ\text{W}$. Iuventæ Fons, the light Ophir, Tithonius L etc are shown up, while the area from the evening limb to the segment which contains the Orson Welles crater is nicely covered in dust/haze. Since a glimpse of S Meridiani is caught beneath the evening haze near the limb, the haze covers about 60° in width ($\tau=26^\circ$). The north of M Acidalium is also thickly

covered.

RSz gave a colour image in cooperation with **J. STÖGER** at $\omega=196^\circ\text{W}$ from Wien which is situated a bit north of 48°N line, and one degree north of Nantes. The spc is blue-whitish. Elysium is bounded by the dark patch at \AEtheria . Propontis I is also caught.

24 June 2016 ($\lambda=174^\circ\text{Ls}\sim 175^\circ\text{Ls}$, $\delta=17.1''\sim 17.0''$)

CFs's main image is at $\omega=129^\circ\text{W}$. The spc has a brightening part. The area of M Sirenum is not so clear, but any trace of the dust spots on 22 June is found. The annular light area at Fortuna is evident to the north of Tithonius L. Olympus Mons is checked near the CM. The arctic region is quite hazed.

25 June 2016 ($\lambda=175^\circ\text{Ls}$, $\delta=17.0''\sim 16.9''$)

EMr's RGB image at $\omega=259^\circ\text{W}$ gives us a pleasant feeling. The spc is very brilliant in G, and the circumpolar large region in RGB to the south of 20°S is nicely enveloped in haze. However the pinkish tint of Ausonia Australis is seen through. The arctic region is also overcast to the north of 50°N , while there may exist a big hole to a bit north of Cydonus Rupes, may be a big spiral.

PGc gave a set at $\omega=269^\circ\text{W}$. The RGB image nicely shows how the southern circumpolar region is shrouded in dusty mist, but it failed to squeeze the whiteness at the spc region. This will be proved if the G image is compared with EMr's G image above.

FMI arranged a couple of colour images at $\omega=276^\circ\text{W}$ and at $\omega=294^\circ\text{W}$. They each show different hues, the latter being more realistic. However the whiteness at the southern limb is less.

CFs struggles solitarily because the European observers are halting. The L-colour image is obtained at $\omega=143^\circ\text{W}$. This image will be helpful with other images to figure out the shape of M Sirenum this season. The arctic thick cloud patch on the evening side is evident from which a thin mist band runs to the north of Propontis I on the morning side. The spc is bright.

26 June 2016 ($\lambda=175^\circ\text{Ls}\sim 176^\circ\text{Ls}$, $\delta=16.9''\sim 16.8''$)

FMI's image is at $\omega=241^\circ\text{W}$. Because of the defect of illumination ($i=27^\circ$), Syrtis Mj is visible quite near the morning terminator. Syrtis Mj is dark and not bluish as a matter of fact.

EMr gave an RGB composite at $\omega=247^\circ\text{W}$. The deserts near the equatorial zone look a bit dirty. The spc is whitish bright. Ausonia Australis shows a bit reddish tint. The southern large area on the morning side to the south of Syrtis Mj is dull dirty. Almost all of Utopia is beneath a large thin haze. Elysium Mons is at the afternoon side but does not show a misty colour.

TWI's IR (and B) images are at $\omega=267^\circ\text{W}$ and at $\omega=282^\circ\text{W}$ (and B at $\omega=268^\circ\text{W}$). We don't understand the implications of these images.

Og's colour image is at $\omega=032^\circ\text{W}$. The area around Auroræ S returned to the usual form from a deformed Human shaped configuration. The spc must be much whiter. The cloud to the east of Iaxartes is

well caught, but the covering of cloud should be more smoothly.

Km produced an excellent L-colour image at $\omega=073^\circ\text{W}$ (B at $\omega=071^\circ\text{W}$). Note that Juventæ chasma is dark while the large area preceding Juventæ Chasma is smoothly hazy up to the evening limb (thus the haze covering 60 degrees). The morning side is also hazy so that the summits of Arsia, Pavonis et Ascræus Montes are poked as a three series of dots in a brownish tint. The annular doughnut at Fortuna is nicely visible. Amazing is the fact that Olympus Mons appears three dimensionally near the morning terminator. Ganges is also brownish as well as the Nilokeras nippers. These are outside the dusty/hazy region. The spc is evident. At the opposite hemisphere some few arctic belt-like clouds are shown up. M Acidalium is mostly beneath the evening haze, stretching out two legs to the arctic region where the arctic cloud patches haunt.

CFs's main image is at $\omega=130^\circ\text{W}$. M Sirenum is not well figured up. The white part of the spc must be much wider. Ophir is white near the evening limb.

27 June 2016 ($\lambda=176^\circ\text{Ls}$, $\delta=16.8''\sim 16.7''$, $\varphi=15^\circ\text{N}\sim 16^\circ\text{N}$)

EMr gave an RGB composite at $\omega=252^\circ\text{W}$. The density balance of R and G differs from e.g. the balance on EMr's R and G on 25 June, and hence the dark markings on the present case look slightly unusual.

CFs took a picture at $\omega=091^\circ\text{W}$, $\varphi=16^\circ\text{N}$. Right half of Ophir is lighter than the left half. Auroræ S does not look complete, maybe because the area around there is hazy. Ganges's tint must be more beautiful. The doughnut-type roundish area near Fortuna is nicely shown up.

28 June 2016 ($\lambda=176^\circ\text{Ls}\sim 177^\circ\text{Ls}$, $\delta=16.7''\sim 16.6''$)

TWI gave an IR and a B image at around $\omega=238^\circ\text{W}$. Both show Elysium, but these do not give us enough information about Elysium.

RSz shows us a couple of 224MC colour images at $\omega=144^\circ\text{W}$ and at $\omega=156^\circ\text{W}$. Both descriptions are as if made in coarse grained, and no details have been obtained. However the sp canopy (but not well edged) is apparent, and the arctic clouds are thickly shown. The former image was caught when the horizontal altitude of the planet was just 21° , and the second image was obtained at altitude 19° .

29 June 2016 ($\lambda=177^\circ\text{Ls}$, $\delta=16.6''\sim 16.5''$)

AWs gave an composite image at $\omega=003^\circ\text{W}$, $\varphi=16^\circ\text{N}$. Such minor markings as Aram Chaos, Ods, the Neudrus double canals and so on are clearly shown, while any marking does not look pure, but slightly opaque because of the general dusty/dirty colour governing. M Acidalium shows also a dusty dull colour on the morning side and further it is covered by some morning haze. The spc has a whitish bright part.

30 June 2016 ($\lambda=177^\circ\text{Ls}\sim 178^\circ\text{Ls}$, $\delta=16.5''\sim 16.3''$)

EMr obtained a nice RGB composite at $\omega=225^\circ\text{W}$. Since the R image is better, and hence the RGB image looks very balanced. The spc is beautifully whitish bright. Ausonia Australis is reddish but a bit

weak because of a covering. Elysium is near the CM, and shows a full variety of colour and shadow, and Cerberus-Phlegra is dirty brownish. The streak near the boundary of Elysium is ground-lit in a pinkish colour, and the two split canal-like part of the Ætheria dark patch is evident, and the area between the two canals is reddish. Utopia is largely occupied by the white cloud which may have a spiral.

Og's image is made at $\omega=002^\circ\text{W}$. The image looks slightly coarser, and the depiction of the arctic large cloud is not well reproduced. The spc looks bright, but looks blurred in colour. The image should be compared with the excellent one composited by AWs on 29 June.

AWs's image is at $\omega=010^\circ\text{W}$. This is similar to the one on the preceding day. While this looks a bit sombre, but is quite neat and decent, describing an overall effect of the preceding dusts. The spc looks natural. The description of the cloud/haze covering is appropriate to the season $\lambda=173^\circ\text{Ls}$. We like this set of images.

CFs took an L-colour image at $\omega=114^\circ\text{W}$. The dark markings which received an effect of dust are gone to the rear side, but the remaining region does not show Ganges and others so clear. The area of the spc is not well processed. □

♂.....**We Further Received:** from Stefan BUDA (SBd), Martin LEWIS (MLw) and Paul MAXSON (PMx) as listed at a subsection of the list of the observers above:

We also here touch on each observation chronologically.

On **24 May 2016** ($\lambda=157^\circ\text{Ls}$), **Paul MAXSON (PMx)** gave a set of images associated with the RGB image at $\omega=262^\circ\text{W}$ plus an IR685 image at $\omega=260^\circ\text{W}$. The RGB composite nicely shows a light and shade nuance of the zone from Ausonia Australis down to the area of the Huygens crater. B shows the white cloud over Elysium Mons. The npc is definite. (Received 28 June)

On **25 May 2016** ($\lambda=158^\circ\text{Ls}$), **PMx** gave two images: the first "Bad seeing image" is at $\omega=260^\circ\text{W}$, and the second is an IR 685 at $\omega=252^\circ\text{W}$: Both gave nothing in particular.

On **26 May 2016** ($\lambda=159^\circ\text{Ls}$), **PMx** gave an RGB image and an IR image at $\omega=260^\circ\text{W}$. The RGB one shows the dark blue Syrtis Mj on the morning side.

On **27 May 2016** ($\lambda=159^\circ\text{Ls}$), **PMx** gave an RGB composite at $\omega=227^\circ\text{W}$ and an IR685 at $\omega=230^\circ\text{W}$. The RGB shows the bluish Syrtis Mj near the morning terminator. Elysium Mons is located at about one hour after noon (in LMT), but already it is covered by an orographic cloud.

On **28 May 2016** ($\lambda=160^\circ\text{Ls}$), **PMx** gave a full set for an RGB composite at $\omega=219^\circ\text{W}$ plus an IR image at $\omega=222^\circ\text{W}$. The RGB shows the bluish Syrtis Mj quite near the terminator. A cloud patch to the north of Propontis I. Elysium Mons is just 24 minutes after noon, but already whitish. The sp canopy looks quite wide. The IR image looks slightly over processed because the dark markings show light fringes.

On **29 May 2016** ($\lambda=160^\circ\text{Ls}$), **PMx** gave a full set for an RGB composite and an IR685 image at $\omega=214^\circ\text{W}$. The RGB shows that Syrtis Mj is quite near or on the terminator with a bluish tint. Elysium Mons is nearly at noon, while the summit is associated with a small cloud. The B image shows that the Elysium cloud is as if connected with the cloud to the north of Propontis I.

On **30 May 2016** ($\lambda=161^\circ\text{Ls}$), **PMx** gave a full set for an RGB composite and an IR685 image at $\omega=203^\circ\text{W}$. Syrtis Mj is no more seen, but instead, a preceding part of M Tyrrhenum and the west end of

Utopia are quite bluish. The latter is apparently enclosed in a branch of the arctic cloud. The cloud at Elysium Mons is unrecognisable. The cloud at Olympus Mons has become inside the disk near the evening limb.

On **31 May 2016** ($\lambda=161^\circ\text{Ls}$), **Stefan BUDA (SBd)** gave three ingredient images and their RGB composite at $\omega=277^\circ\text{W}$. The RGB image shows some effect of the airborne dust, but such minor details as the Baldet crater, the Huygens crater, the Schröter crater, and the Herschel crater are visible. At the SE of the npc there is a small dense cloud. The cloud at Elysium Mons is very bright now near the evening limb. The inside of Hellas is almost of sandy colour, but the SE corner is very whitish covered by a protruded fringe of the sp canopy.

On **8 June 2016** ($\lambda=166^\circ\text{Ls}$), **Martin LEWIS (MLw)** gave a 174 MC colour image at $\omega=350^\circ\text{W}$. The dark markings are rather monotonous, but the limb haze is effectively shown. Especially M Acidalium on the morning side is half covered by whitish haze. From the area of the npc there rises a misty band upwards. The south polar canopy is dull, though some partially protruded fringe is shown. □

(Masatsugu MINAMI and Masami MURAKAMI)

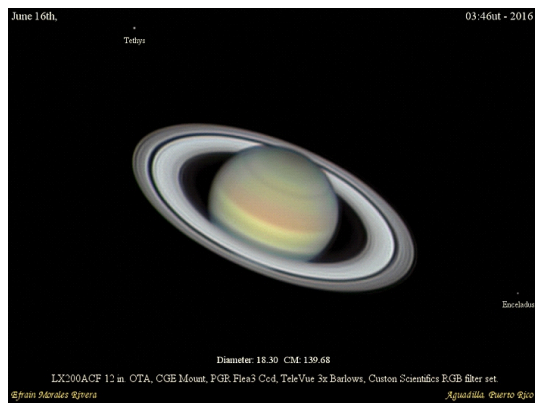
Letters to the Editor

●.....**Subject: Mars - June 14,15th**
Received: 16 June 2016 at 10:46 JST

Hi Mr.Minami and All!, Here I submit my sessions from the 14th, 15th Still in fluence by the Saharra dust aerosols.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160614/EMr14June16.jpg>
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160615/EMr15June16.jpg>

○.....**Subject: Mars - May 16th**
Received: 17 June 2016 at 10:23 JST



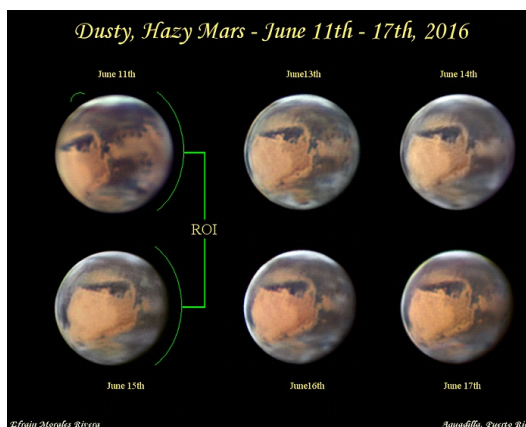
Hi Mr. Minami and All!, Here is my session from june 16th and an image taken on the same run of Saturn.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160616/EMr16June16.jpg>

○.....**Subject: Mars - june 17th**
Received: 19 June 2016 at 13:10 JST

Hi Mr. Minami and All!, Here I submit my session from the 17th of june and a composition of images showing the possible dust activity in many regions.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160617/EMr17June16.jpg>



○.....**Subject: Mars - June 19th, 23rd**
Received: 24 June 2016 at 11:54 JST

Hi Mr. Minami and All!, Here I submit my latest sessions from june 19th and 23rd.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160619/EMr19June16.jpg>
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160623/EMr23June16.jpg>

○.....**Subject: Mars - 25th,26th**
Received: 29 June 2016 at 23:06 JST

Hi Mr. Minami and All!, Here I submit my sessions from June 25th, 26th. Still under the influence of the Saharra dust aerosols.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160625/EMr25June16.jpg>
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160626/EMr26June16.jpg>

Efrain MORALES (Aguadilla, Puerto Rico)

●...*Subject: Mars image - June 15*
Received: 16 June 2016 at 13:00 JST

Gentlemen, Attached is a set of images from June 15.
 See was only average, at best. Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160615/PGc15June16.jpg>

○...*Subject: Mars images - June 17 & 18*
Received: 19 June 2016 at 02:58 JST

Gentlemen, Attached are images from June 17 and 18. Seeing was about average on both nights. Transparency was poor on the 17th and good on the 18th. Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160617/PGc17June16.jpg>
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160618/PGc18June16.jpg>

○...*Subject: Mars images - June 19 and June 25*
Received: 27 June 2016 at 01:16 JST

Gentlemen, Attached are images from June 19 and June 25. Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160619/PGc19June16.jpg>
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160625/PGc25June16.jpg>

Peter GORCZYNSKI (Oxford, CT)

●...*Subject: Mars 2016/06/15 CM251 CM290*
Received: 16 June 2016 at 19:14 JST

Hi all, At last some clear sky last night and improved seeing conditions (above average). In the later image, I note that the cloud that appears to extend WNW from Hellas is still present. Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160615/CFs15June16.jpg>

○...*Subject: Mars 2016/06/16 1856UT CM233*
Received: 17 June 2016 at 18:10 JST

Hi all, Seeing was average to poor. This was about the best I could get for the evening. Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160616/CFs16June16.jpg>

○...*Subject: 16/06/18 CM210 POSSIBLE LOCALISED DUSTS*
Received: 19 June 2016 at 04:45 JST

Hi all, Improved seeing conditions this evening. Having taken a few images with the ASI 224MC, I noted a few yellowish bright spots in the Mare Sirenum region. I changed to the ASI174MM for RGB captures and attach the R image. There is a small G component, but I did not see anything significant in

the B image. I compared with Christopher Go's image of 9 June, where there does not appear to be any bright spots as per my image. Possible localised dust storms? Regards,

○...*Subject: 16/06/18 CM210 POSSIBLE LOCALISED DUSTS*
Received: 19 June 2016 at 06:50 JST

Hi all, Attached my normal image set which was taken a bit earlier than the monochrome red image I circulated previously. As noted, I suspect the orange/yellow spots in the Mare Sirenum area may be dust activity, but welcome any comments in this regards. Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160618/CFs18June16.jpg>

○...*Subject: 16/06/18 CM210 POSSIBLE LOCALISED DUSTS*
Received: 19 June 2016 at 11:10 JST

Thanks Roger. Noted. As per my response on ALPO Mars observers, one of the reasons for my suspicion was that I checked a few recent images of the region and did not see anything as prominent as the two spots. Hopefully I can get similar seeing tonight for followup and confirmation. Best regards,

○...*Subject: Mars, 2016 April 20*
Received: 20 June 2016 at 23:35 JST

Hi all, Poor conditions again on the 19th June, but submitting the best image I could eke out, for the record. Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160619/CFs19June16.jpg>

○...*Subject: Mars 2016/06/20 1848UT CM196*
Received: 21 June 2016 at 15:21 JST

Hi all, Seeing was improved last night (average to above average). I have adjusted colour balance a bit to try and enhance the extensive light cloud around the north polar region. Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160620/CFs20June16.jpg>

○...*Subject: Mars 2016/06/22 1718UT CM156*
Received: 23 June 2016 at 19:14 JST

Hi all, Average to above average seeing last night. The Symplegades bright spots are quite prominent.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160622/CFs22June16.jpg>

○...*Subject: Mars 2016/06/24 1644UT CM129*
Received: 26 June 2016 at 04:14 JST

Hi all, Seeing has been below average to poor the last few evenings. Attached is the best I could get from 24 June, for the record. Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160624/CFs24June16.jpg>

○...*Subject: Mars 2016/06/25 1819UT CM143*
Received: 26 June 2016 at 15:27 JST

Hi all, Some periods of average seeing last night. Quite a bright cloud in the north polar region.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160625/CFs25June16.jpg>

○...*Subject: Mars 2016/06/26 1804UT CM130*
Received: 27 June 2016 at 23:13 JST

Hi all, Unfortunately not good conditions last night and with this particular face of Mars, focussing is a challenge. However, the changing cloud structures keep things interesting, particularly in the northern hemisphere. The reducing size is also very evident on a day today basis now. Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160626/CFs26June16.jpg>

○...*Subject: Mars 2016/06/27 1558UT CM91*
Received: 28 June 2016 at 05:38 JST

Hi all, Conditions were best in the early evening, although still only average. Other than the north polar cloud activity, cloud also appears to be extending across most of the preceding limb. Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160627/CFs27June16.jpg>

○...*Subject: RE: Mars 2016/06/27 1558UT CM91*
Received: 28 June 2016 at 17:43 JST

Hi all, I just wanted to highlight a feature which is just detectable in my image of last night (rotating out of view) and which has been very nicely captured by Saran Poshyachinda in an image taken 27 June . There is a distinct orange area to the preceding side of the north polar region, with a central dark spot, which I assume to either be dust deposit or active dust storm. Suggest this should be monitored? Best,

○...*Subject: RE: 16/06/27 CM91 with comparison images*
Received: 29 June 2016 at 15:58 JST

Thanks, Jim. I had been looking at Anthony Wesley's amazing images from the 22/23 June for comparison, but you have resolved the issue nicely.

Regards,

Clyde FOSTER (Centurion, SOUTH AFRICA)

●...*Subject: Mars 2016 May 24, June 1, 10, 11*
Received: 17 June 2016 at 05:57 JST

Dear Richard and Masami, Here's a batch of four Mars images that I had not yet processed. Of these nights, May 24 had the best seeing conditions. Quite

cloud free with morning/evening hazes, small north polar cloud and light Olympus Mons on May 24, thin morning clouds over Tharsis on June 1, and Hellas bright with clouds on June 10 and 11. We are now in a period of unsettled weather with some rain, but I hope for somewhat more stable conditions next week.

With best wishes,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160611/JWr11June16.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160610/JWr10June16.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160601/JWr01June16.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160524/JWr24May16.jpg>

○...*Subject: Mars, 2016 April 20*
Received: 20 June 2016 at 23:35 JST

Dear friends, Sending an image obtained as long ago as two months, on April 20, but which has gone unprocessed. Detailwise it turned out pretty good considering what has been possible to obtain from here this apparition, but it would have needed a couple of more avi:s to reduce noise and mottling. A minute SPC is visible, as well as evening orographics over the Tharsis volcanoes. Olympus Mons is central on the CM. Best wishes,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160420/JWr20Apr16.jpg>

○...*Subject: Mars June 18 and 21*
Received: 23 June 2016 at 14:48 JST

Dear friends, High summer has reached us with sun and warmth and also some opportunities for imaging, even though seeing continues to be poor at the low altitude of Mars. Perhaps the best image of this season was obtained on two nights ago on June 21, with Elysium on the CM with its brighter morning-facing side, well defined by dark features. Cloud activity is highest near the northern pole and limbs. June 18 was clear but terribly turbulent, and I could obtain only a single useful AVI at a seeing of 2/10, but at least it shows a bright Ausonia and a bright cloud over the Nilosyrtis area. The end of the Mars season is clearly approaching for me as the bright summer nights now makes Mars reachable only after culmination. Soon it will be too low as well as blocked by a cluster of birches in the garden. It is a wonderful time of the year with the short nights filled with the sounds of frogs, birds and fluttering bats - and no mosquitos! Best wishes,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160618/JWr18June16.jpg>
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160621/JWr21June16.jpg>

Johan WARELL (Skurup, SWEDEN)

●.....*Subject: Mars May 17*
Received: 17 June 2016 at 08:55 JST

Mars, May 17 in average seeing.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160517/PMx17May16.jpg>

○.....*Subject: Mars May 20*
Received: 20 June 2016 at 11:15 JST

Average seeing for these Mars.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160520/PMx20May16.jpg>

○.....*Subject: Mars May 21*
Received: 22 June 2016 at 12:34 JST

Mars from May 21

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160521/PMx21May16.jpg>

○.....*Subject: Mars May 22*
Received: 23 June 2016 at 11:43 JST

Mars from May 22.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160522/PMx22May16.jpg>

○.....*Subject: Mars May 23*
Received: 25 June 2016 at 08:07 JST

About average.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160523/PMx23May16.jpg>

○.....*Subject: Mars May 24*
Received: 28 June 2016 at 03:29 JST

Mars in average seeing from May 24.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160524/PMx24May16.jpg>

○.....*Subject: Mars May 25*
Received: 29 June 2016 at 00:45 JST

Mars, May 25. Bad seeing.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160525/PMx25May16.jpg>

○.....*Subject: Mars May 26*
Received: 30 June 2016 at 09:03 JST

Unsteady seeing here.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160526/PMx26May16.jpg>

Paul MAXSON (Surprise, AZ)

●.....*Subject: Mars RGB set from 15 June 2016*
Received: 17 June 2016 at 13:03 JST

Hello everyone, Please find attached an image set captured in variable seeing with quite good moments. Richard McKim sent out an alert yesterday for dust storm activity around Margaritifer Sinus, near Vales Marineris. My image show the area right on the evening limb and the blue haze makes it difficult to tell

dust clouds from vapour clouds. Best Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160615/SBd15June16.jpg>

○.....*Subject: Mars image set from one month ago*
Received: 29 June 2016 at 21:02 JST

Hi everyone, Please find attached an image set that was captured one month ago - just after closest approach. Best regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160531/SBd31May16.jpg>

Stefan BUDA (Melbourne, AUSTRALIA)

●.....*Subject: Mars: June 15, 2016*
Received: 17 June 2016 at 13:46 JST

Hi, I have attached my images of Mars June 15, 2016. Thanks,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160615/FM115June16.jpg>

○.....*Subject: Mars: June 17, 2016*
Received: 18 June 2016 at 09:21 JST

Hi, I have attached my latest image of Mars June 17, 2016 at 3:04 UT. Thanks,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160617/FM117June16.jpg>

○.....*Subject: Mars: June 18, 2016*
Received: 19 June 2016 at 13:12 JST

Hi, I have attached my images of Mars June 18, 2016 at 3:00 UT. Thanks,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160618/FM118June16.jpg>

○.....*Subject: June 19, 2016*
Received: 22 June 2016 at 12:47 JST

Hi, I have attached my image of Mars June 19, 2016 at 3:08 UT. Thanks,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160619/FM119June16.jpg>

○.....*Subject: June 20, 2016*
Received: 22 June 2016 at 12:48 JST

Hi, I have attached my image of Mars June 20, 2016 at 2:38 UT. Thanks,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160620/FM120June16.jpg>

○.....*Subject: Mars: June 21, 2016*
Received: 22 June 2016 at 12:50 JST

Hi, I have attached my latest images of Mars June 21, 2016 at 1:59 UT. Thanks,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160621/FM121June16.jpg>

○.....*Subject: Mars: June 23, 2016*
Received: 25 June 2016 at 14:20 JST

Hi, I have attached my latest image of Mars June 23, 2016 at 2:49 UT. Thanks,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160623/FM123June16.jpg>

○.....*Subject: Mars: June 25, 2016*
Received: 26 June 2016 at 06:59 JST

Hi, I have attached my latest image of Mars June 25,
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160625/FMI25June16.jpg>

○.....*Subject: Mars: June 26, 2016*
Received: 30 June 2016 at 08:45 JST

Hi, I have attached my latest image of Mars June 26, 2016 at 1:00 UT. Thanks,
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160626/FMI26June16.jpg>

Frank J MELILLO (Holtsville, NY)

●.....*Subject: Mars 2016/06/16*
Received: 18 June 2016 at 23:58 JST

Hello, here is a set under very good conditions but low alt. South and North polar hoods are visible. Hellas looks clear with some thin clouds only. Clouds over Aeria and Boreosyrtris.

http://www.hellas-astro.gr/sites/default/files/images/observations/mars/2016-06-16-20-36-00_2095.jpg

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160616/MKd16June16.jpg>

Manos KARDASIS (Glyfada-Athens, GREECE)

●.....*Subject: Re: 2X RGB observations of Mars June 15th 2016*
Received: 19 June 2016 at 10:42 JST

Dear Mr. Minami and Mr. Murakami, I hope you are both well. Please find attached two RGB sets that I took of Mars on the 15th June. I haven't had the chance to process them until this morning. The seeing was excellent, and I caught the Tharsis regions of Mars. I also saw the Mariner Valley moving to sunset (Tithonius Lacus), which I have never managed to image before. There are some interesting cloud formations, particularly on the second image the cloud over Elysium Mons is just on the morning terminator, and a cloud has formed at the eastern end of the Mariner Valley (Xanthe?), the cloud was not there in the first image. There is also a curled cloud over Arcadia and many small cirrus formations over Tharsis generally. It is amazing how dynamic Mars is. I also invite you to check out my new website where I put all my planetary images, not just of Mars. There is a link below. I also had an excellent view of Jupiter and Saturn that same night. Thank you,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160615/DWd15June16.jpg>

David WELDRAKE (NSW, AUSTRALIA)

●.....*Subject: Mars Observation (June 17, 2016)*
Received: 21 June 2016 at 06:28 JST

Dear Mr. Murakami, I hope that you and your colleagues are doing well. I made an observation of the planet Mars on June 17, 2016 (01:30 U.T., CM 329°W) using my 9-inch (23-cm) F/13.5 Maksutov-Cassegrain (258x/388x, Baader Mark III Zoom, IL, Wratten 23A (Light Red) filter, and W 80A (Blue) filter). It appears that dust storms are visible over the Martian globe at this longitude over both the northern and southern hemispheres. A prominent dust storm is obscuring the regions of Dioscuria /Cecropia /Cydonia /Ortygia to the north. A dust storm appears to have originated within the vast Hellas basin and is spreading westward over the southern border of Aeria and north of Sinus Sabæus. Fine detail was noted over the northern tip of Syrtis Major. The best of luck in your own observations of Mars. Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160617/CHr17June16.jpg>

○.....*Subject: Mars Observation (June 14, 2016)*
Received: 21 June 2016 at 06:32 JST

Dear Mr. Murakami, I made an observation of the planet Mars on June 14, 2016 (04:24 U.T., CM 039°W) using my 9-inch (23-cm) F/13.5 Maksutov-Cassegrain at 282x and 352x (Explore Scientific 82° eyepieces that provided excellent color, contrast and sharpness). I was able to detect fine detail while observing under excellent seeing conditions (7-8/10). The major albedo features visible towards the north were Mars Acidalium (3-4/10 and mottled), Niliacus Lacus (3/10) and Oxia (4/10). To the south Mare Erythræum (3-4/10 and mottled), Margaritifer Sinus (3/10), Oxia Palus (3/10), and bright, (6-7/10) curvilinear streaks that correspond to the floor of the vast Martian canyon system, Valles Marineris. Bright clouds were visible over the limbs of the planet. The North Polar Cap (NPC) appears small and brilliant (10/10). The best of luck to you. I meant to say my best to you and all members of CMO Mars. Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160614/CHr14June16.jpg>

Carlos E. HERNANDEZ (Miami, FL)

●.....*Subject: Mars - June 15, 16, 1& 17*
Received: 22 June 2016 at 08:33 JST

Dear Masatsugu and Masami, Attached are some images of Mars I took on the mornings of June 15, 16 and 17. All three appear to show a dust event in the Aurorae Sinus, Pyrrhae Regio, and Mare Erythraem regions. The prevailing winds also appear to be blowing the dust first southward and then eastward in the later images. Too bad the skies were cloudy on three previous nights or perhaps I could have caught the beginning of this event. Some interesting clouds to the north flowing out of Cydonia and over Mare Acidalium. Lots of blue haze on the morning side.

Best wishes,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160615/WF115June16.jpg>
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160616/WF116June16.jpg>
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160617/WF117June16.jpg>

Bill FLANAGAN (Houston, TX)

●.....*Subject: Mars, 21st June*
Received: 22 June 2016 at 12:45 JST

The jetstream continues to be exceptionally fierce around here, but last night was a little better than other nights. Here's a colour image of Mars showing Olympus Mons at lower left (rising) and the Tharsis volcanoes at centre, Valles Marineris at right. There are clouds over both the poles (north at top left) as well as over the equatorial region setting at right.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160621/AWs21June16.jpg>

○.....*Subject: Mars, June 22*
Received: 23 June 2016 at 12:58 JST

Hi all, here's an image of Mars from last night. The Tharsis volcanoes are rising at lower left with Olympus Mons just coming into daylight.

Valles marineris is visible at lower centre and clouds around the poles top left and lower right.

<http://www.acquerra.com.au/astro/gallery/mars/20160622-114654/m20160622-114654utc.png>
 cheers, Anthony

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160622/AWs22June16.jpg>

○.....*Subject: Mars, 23rd June*
Received: 24 June 2016 at 09:08 JST

Hi all, here's a Mars image from last night. Seeing about the same as previous or maybe slightly better. This image has better colour balance and shows the clouds a bit more prominently. Compared to yesterdays image you can see

that the clouds have changed quite a bit.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160622/AWs22June16.jpg>

○.....*Subject: Mars, June 29*
Received: 30 June 2016 at 12:02 JST

Attached is an image of Mars from last night, seeing was the best we've had in a while here. I don't know if the murky appearance is due to dust of poor seeing, but it looks quite interesting.

Link:

<http://www.acquerra.com.au/astro/gallery/mars/20160629-111412/m20160629-111412utc.png>
 cheers, Anthony

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160629/AWs29June16.jpg>

Anthony WESLEY (NSW, AUSTRALIA)

●.....*Subject: mars image*
Received: 23 June 2016 at 07:20 JST

Dear Sirs: I have attached our first Mars observation. I am a member of the Asociacion Entrerriana de Astronomia, from Oro Verde, Entre Rios, Argentina. Our association is beginning it's planetary observations of Mars. We are active in the cometary and lunar observations, and we would like to participate in the planetary observation. I hope our image could be useful. These are the data of the observation:

Name and location of observer: Francisco Alsina Cardinalli (Oro Verde, Argentina). *Date and time (UT):* 06-19-2016 -05:29. *Filter:* Astronomik ProPlanet 742 IR-pass. *Size and type of telescope used:* 250 mm SCT (Meade LX 200).

Medium employed: QHY5-II.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160619/FCd19June16.jpg>

Congratulations for CMO Newsletter, it is a very pleasant reading, thank you very much for that.

Kind regards,

Alberto ANUNZIATO (Entre Rios, ARGENTINA)

●.....*Subject: Mars observations 21th and 23th June 2016*
Received: 26 June 2016 at 22:47 JST

Dear CMO/OAA-team ! Here are my latest Mars observations from 21st June 2016 and 23rd June 2016.

The picture on 21st I took with my usual setup (Celestron 8). I used Winjupos to combine 7 individual videos. The picture on 23rd I took together with my friend Jürgen Stöger in his observatory near Wr. Neustadt. Instrument used was his Newton 300/1500.

I used Winjupos to combine 15 individual videos.

best regards

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160621/RSz21June16.jpg>
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160623/RSz23June16.jpg>

Robert SCHULZ/Jürgen STÖGER (AUSTRIA)

●.....*Subject: Mars 2016.06.21*

Received: 27 June 2016 at 03:08 JST

Dears, Under a correct night start, Mars with Utopia and Elysium planitia, with clouds over the polar zones. Steady skies,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160621/MDc21June16.jpg>

Marc DELCROIX (Tournefeuille, FRANCE)

●.....*Subject: Mars 8th June and 5th June rework*

Received: 27 June 2016 at 07:45 JST

Hi, Attached is an image of Mars from 8th June at 17deg altitude in reasonable seeing. I also include a rework of my Mars image from the 5th June imaged in better seeing and where I have now used sharpening in Astra Image to better bring out detail.

Also included for interest is a composite of the three planets imaged on 5th June all shown at the same angular image scale. All the best

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160608/MLw08June16.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160605/MLw05June16.jpg>

Martin R LEWIS (Hertfordshire, the UK)

●.....*Subject: Mars Report*

Received: 10 July 2016 at 19:09 JST

Dear Masatsugu: I have been trying to complete the BAA 2010 Mars report, inbetween trying to observe the current apparition and doing other

BAA-related tasks. I recall that in 2011 you sent me your 2003 Mars paper (part 1) written together with Mr Nakajima, and I have referenced it in the 2010 report for the sake of completeness. Have you published any other reports in this series, please? I would like to see any if you have, and would certainly like to give references to them. Thank you in advance.

There has been quite a long delay in finishing these Mars reports because I spent a lot of my spare time doing my other job as BAA archivist. We are preparing a CD set of all the BAA Memoirs from 1890 to 1990, so all these rare publications (and in particular all the older Mars Memoirs) will be available. I also wrote 11 Saturn Section reports covering the years 1994 and 2005. These extra tasks have meant that only recently could I get back to completing the final BAA Mars reports. It is surprising how difficult it is to recall the events of six years ago, even with all the data in front of me. But with a longer lifetime of observing Mars I expect you have the same difficulty. I find that I need to immerse myself in the data for several weeks before I can really do the task effectively.

I hope all is well with you and that your summer in Japan has more sunshine than ours. Last month I had only six clear evenings for Mars! Now that is poor, even for the UK! With good wishes

Richard McKIM (BAA Mars Section)

☆☆☆

International Society of the Mars Observers (ISMO)

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

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

CMO n°451/ ISMO #77 (10 July 2016)

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



☆ Any e-mail to CMO/ISMO including the image files is acknowledged if addressed to

cmo@mars.dti.ne.jp (Masami MURAKAMI in Yokohama)

vzv03210@nifty.com (Masatsugu MINAMI at Mikuni-Sakai, Fukui)

☆ Usual mails to CMO are acknowledged if addressed to

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