

MARS

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OBSERVATIONS

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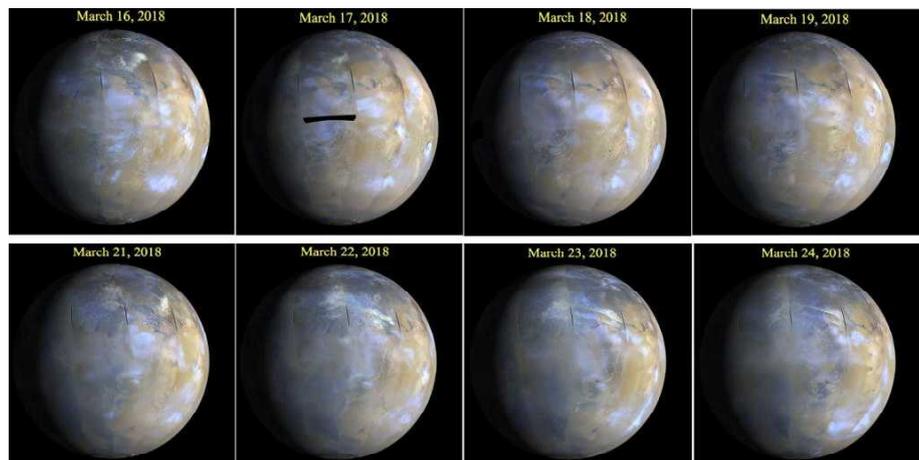
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CMO/ISMO 2018 Mars Report #05

2018 CMO/ISMO Mars Observations Made
in March 2018 ($\lambda=137^\circ\text{Ls}$ ~ $\lambda=152^\circ\text{Ls}$ 2018)By
Masatsugu MINAMI and Masami MURAKAMI

♂..... We shall treat here the fifth Mars Report of the 2018 ISMO Mars Observations carried out in March 2018. In March the planet Mars moved celestially from the Ophiuchus constellation to the Sagittarius constellation, and the apparent declination D moved from 22°S to 23°S . On 19 March, the planet passed between the Trifid (M20) and the Lagoon (M8) Nebulae and went to the direction of the planet Saturn. On 24 March the planet Mars attained the western quadrature. From Japan the planet Mars rose at around 1 o'clock JST. The apparent diameter δ of Mars varied from $\delta=6.7''$ to $\delta=8.4''$ in March, now large enough to observe visually the surface. In March the Martian season proceeded from $\lambda=137^\circ\text{Ls}$ to $\lambda=152^\circ\text{Ls}$. So it was the season to check the morning clouds at the northern higher latitudes. The tilt moved from $\phi=01^\circ\text{N}$ to $\phi=06^\circ\text{S}$. That is, henceforward in 2018, the south pole will face towards us, and so the south polar region will be always an object to be monitored. The phase angle ι will vary from 38° to 41° in March. The defect of illumination was to be prominent at the southern evening side.

♂..... The images of the MRO MARCI were steadily disclosed in March 2018. The decaying white Hellas was well chased, and some activity on the southern higher latitudes was checked. In mid-March some dust activity around at Solis Lacus was caught and chased. It was finally expanded along Coprates Chasma or Valles Marineris.



The mist along the equatorial zone was rather active in the afternoon, sometimes it invaded Syrtis Mj, and sometimes it expanded to the direction of Thymiamata. At the end of March, there was checked the mist zone from Elysium, via Libya to Syrtis Mj. The orographic activity has been weaker at Tharsis except for the Arsia area. Alba sent a thick white cloud to Tempe at the end of March. The white cloud at Elysium Mons was variable day by day. No big dust dis-

turbance was caught by the MRO-MARCI. No Cyclone was recorded.

♂.....Clyde FOSTER (CFs), South Africa, diminished his observation frequency in March due to his big sorrow and an serious accident which occurred on his telescope (refer below to his LtE received on 17 March). We received however seven observations from CFs made during March. Damian PEACH (DPc) from the UK was active by remote controlling a 100 cm at Chile and produced several superb images in collaboration with the Chilescope team. From DPc we received 12 sets of colour images. From Australia, we received 8 numbers of observations from Maurice VALIMBERTI (MVI) and Phil MILES (PMI). Efrain MORALES (EMr), Puerto Rico, sent us five observations. From Japan, Teruaki KUMAMORI (Km) and Tsutomu ISHIBASHI (Is) observed a total of 30 observations mostly in late-March because the weather a bit settled down. As to the above activity checked by MRO-MARCI around at Solis Lacus, MVI and Km had the chance to survey the area in question, but unfortunately they could not positively indicate. Still, the continuous observations are too hard to be well performed.

♂.....What follows is the list of the observers and the instruments they used in March. We would like to appreciate their continued cooperation and hope for their future activities.

FOSTER, Clyde (CFs) Centurion, SOUTH AFRICA

7 Sets of RGB + 7 IR Images (1, ~ 5, 16, 20 March 2018) 36cm SCT @ f/27 with an ASI 290MM

ISHIBASHI, Tsutomu (Is) Sagamihara, Kanagawa, Japan

2 Colour Images (12, 26 March 2018) 31cm speculum, with an ASI 290MC

KUMAMORI, Teruaki (Km) Sakai, Osaka, JAPAN

14 Colour* + 13 R + 14 B Images (2, 6, 10, 11, 14, 17, 22, 23, 26, 25,~28, 30, 31 March 2018)
36cm SCT @ f/40 with an ASI 290MM & ASI 224MC*

MILES, Phil (PMI) Rubyvale, QLD, AUSTRALIA

1 Set of RGB Images (1 March 2018) 51cm Spec with a PGR GS3-U3-32S4M

MORALES RIVERA, Efrain (EMr) Aguadilla, PUERTO RICO

5 Sets of RGB + 3 IR Images (1, 9, 12, 17, 27 March 2018) 31cm SCT with an ASI 290MM

PEACH, Damian A (DPc) Selsey, WS, the UK, remote controlled the Chilescope Team in CHILE

5 Sets of RGB + 7 colour Images (1, ~ 3, 7, 15, 20, 25, 27, ~ 31 March 2018)
Chilescope (100cm Richey Chretien)

VALIMBERTI, Maurice (MVI) Melbourne, AUSTRALIA

7 Sets of RGB + 7 IR Images (2, 6, ~8, 21, 29 March 2018)
36cm Richey Chretien @ f/22, with an ASI 290MM

♂.....We are now in a position to give some comments to the observations made in March 2018: Please refer to each image recorded in our [CMO/ISMO Mars Gallery of the 2018 Mars](http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2018/f_image.html):

http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2018/f_image.html

1 March 2018 ($\lambda=137^\circ\text{Ls}$, $\delta=6.7''$)

Clyde FOSTER (CFs) gave an RGB image together with its three ingredients (plus an IR 685 image) at $\omega=070^\circ\text{W}$, $\phi=01^\circ\text{N}$. The telescope used is a 36cm SCT. The images are enlarged by the use of a 2,5×Televue Barlow The camera used is a ZWO ASI 290MM and the filters are from Baader. The RGB image is not so colourful, while the R component suggests a lot of minor dark markings. Mare Acidalium is not so distinct because it lies near at the evening terminator, while its bottom is quite dark and the following Nilokeras still remains evident inside the disk, shown also on the IR image. The southern area around Auroræ Sinus is within range, and Ophir-Candor and Ganges are evident on the RGB. Solis Lacus is near

the morning limb but suggests a darker aspect together with Tithonius Lacus as well as some Tharsis markings. On the B image the southern polar area looks whitish hazy.

Efrain MORALES (EMr) showed us the three sets of R, G, B images with an RGB composite at $\omega=163^\circ\text{W}$. The instrument used is a 31cm SCT (LX200ACF 12in), and the camera is an ASI 290MM, equipped with RGB filters from Custom Scientific. The dark markings do not so detailed, but apparently Proponitis I and Phlegra face each other with the central meridian. More interesting result is provided by the B image where a couple of broad white cloud streaks are described evidently from the Tharsis area near the evening terminator towards the north-western direction. It will be more valuable if these observations were repeated several times.

Damian PEACH (DPc) produces Mars images by remote controlling the Chilescope (100cm Richey Chretien) which is located at (30°27'S, 70°45'W) in Chile in cooperation with a so-called Chilescope team. This time the image at $\omega=168^\circ\text{W}$, $\phi=01^\circ\text{N}$ was obtained. The observing time of DPc is at 10:15 GMT while EMr made the set at 09:56 GMT and so the time difference is about 20 minutes. So it is expected to say about the white clouds recorded by the B image of EMr. However, unfortunately, the seeing condition at Chile must have been poorer than expected. No detail is shown at Mare Cimmerium, and just Cerberus, Phlegra and Proponitis I are suggested. The upper cloud layer of the EMr's B image must have been identified with a localised cloud patch at Olympus Mons and its surrounding. However the lower cloud layer of EMr's B image cannot explicitly be identified on DPc's image.

Phil MILES (PMI) brought about an excellent set of R, G, B images together with the RGB composite at $\omega=275^\circ\text{W}$, $\phi=01^\circ\text{N}$ by the use of a 51cm Fullum Air Tech Mirror (denoted PGR Grasshopper3 GS3-U3-32S4M). Every ingredient shows some distinctive characteristics. The RGB composite shows therefore a nice feature of Hellas surrounded by Yaonis Fretum and Mare Australe; the inside of Hellas showing a depressive point which is evident in R and G. Syrtis Major shows the Huygens crater. The northern part of Syrtis Mj looks to show a greenish-blue tint due to the effects of G and B. The projection from the eastern coast of Syrtis Mj is also evident. Nodus Alcyonius, Cassius and Boreosyrtis are distinctly shown up. It should be noted that a small spot is visible at the area of the lost area of Deltoton S. From this spot there are followed a spotted line downwards to Boreosyrtis. The northern end is roundish-whitish especially thick in B. The arctic haze must be sent towards Utopia.

2 March 2018 ($\lambda=137^\circ\text{Ls}$, $\delta=6.7\sim6.8''$)

First, **CFs** took three R, G, and B ingredients and obtained an RGB composite at $\omega=050^\circ\text{W}$. An IR685 image is also associated. The composite image looks rather unclear, but contains some details due to the R image. The dim area at Chryse is made of several spikes. The area of Auroræ Sinus shows the spikes, though not so clear. Ophir-Candor is light clear, and Agathodæmon as well as the eastern tip and its western associate of Tithonius L are well shown. Solis Lacus looks vague, not clear in shape, but the denser part can be pinned down. Mare Acidalium is fully shown in R while some areas inside in RGB look covered interestingly by the evening mist which reaches the west coast (upto the top of Nilokeras). The northern bottom of M Acidalium looks dark. At the antarctic area a dull haze is shown due to G and B. If the distribution of the white mists at the northern hemisphere could be more neatly described, the shape of M Acidalium would appear more amazing.

DPc obtained a single RGB composite at $\omega=159^\circ\text{W}$ in the collaboration with the Chilescope team. The seeing must have not been stable in general, while the ejected-feet associated with the Gale and Knobel craters are amazingly evident very near at the morning limb. To their north Trivium Charontis is shown vaguely out of the morning mist, and Propontis I is a bit dark and looks split in two. The white cloud associated with Olympus Mons appears as separated from the evening terminator clouds at Tharsis. The Alba white cloud looks thicker.

Maurice VALIMBERTI (MVI) from Melbourne put forwards two sets of R, G, B ingredients to compose two RGB composites; the first one is at $\omega=272^\circ\text{W}$, $\varphi=01^\circ\text{N}$ and the second series at $\omega=281^\circ\text{W}$; two are nicely separated by about 40 minutes. MVI used a 36cm Richey Chretien @f/22 equipped with the ASI 290MM camera together with the Astronomic Type IIC RGB filters and for the IR used Custom Scientific Bessell IR filter. The first composite image at $\omega=272^\circ\text{W}$ looks a bit better where Syrtis Major is described better. It is possible to check the three markings of N Alcyonius, Cassius and Boreosyrtis. Both RGB images show Hellas is outstanding, whitish bright in B.

Teruaki KUMAMORI (Km) made an L-colour image at $\omega=315^\circ\text{W}$: The L is the one stacked from 40,000 frames (11 minutes derotation) and the colour image was made from 24,000 frames. The L was taken by using ASI 290MM, and the colour image was from ASI 224MC. In this L-colour, Syrtis Mj is dark evident and Sinus Sabæus is shown, while Hellas is quite dim. Noachis is duller. The arctic area is hazed. Otherwise Km made B image at $\omega=319^\circ\text{W}$ and R image (18 minute derotaion, 88,000 frames) at $\omega=322^\circ\text{W}$. In B, no white matter is recorded.

3 March 2018 ($\lambda=138^\circ\text{Ls}$, $\delta=6.8''$)

CFs obtained the three R, G, B ingredients and composited RGB image at $\omega=035^\circ\text{W}$, $\varphi=01^\circ\text{N}$. CFs also attached an IR685 image. Perhaps due to the excellent B image, at the southern polar area the polar haze shows unevenness, and Mare Acidalium near the CM looks to be somewhat extraordinary due to some irregular distribution of white haze (especially at the western coast). In stacked R, the morning Tithonius L and Auroræ Sinus are nicely caught and Ophir-Candor is light evident. As well, Ganges and Nilokeras prove to be interesting. The shapes of Nilokeras and M Acidalium are more usual in R and IR: In general the northern part of M Acidalium is much darker than the other side, while in RGB, M Acidalium looks a bit strange because some Acidalia parts are underneath the covering of the white mist groups. In general, the evening side of the present disk suffers maybe from the so-called vignetting, and hence it is harder to watch the dusky markings near the evening terminator ($t=39^\circ$).

DPc provided with the Chilescope team a single RGB composite at $\omega=146^\circ\text{W}$, $\varphi=00^\circ\text{N}$. M Sirenum looks to be darkly caught, while the details are beyond. At the morning limb side, the area of Trivium Charontis and the broken Propontis I. Perhaps the B image is effective, and the western flank of Olympus Mons has just been clouded. Near at the evening limb, Tharsis is clouded and especially Alba is thick. The Antarctic area is covered by a weak haze.

4 March 2018 ($\lambda=138^\circ\text{Ls}$, $\delta=6.8''$)

CFs obtained an RGB composite at $\omega=020^\circ\text{W}$, $\varphi=00^\circ\text{N}$ together with three ingredients and an IR685 image: Every image is excellent. Among them the R image is more specifically successful: S Meridiani is

explicit near the evening terminator with the small but identifiable Oxia P. Mare Acidalium and Niliacus Lacus are fully shown, though the central and the southern part look slightly faded, while the triangle pedestal-marking at the bottom is quite dark. To its north, the npc looks to locates. Nilokeras is also clearly caught in R. Agathodæmon and he preceding tip of Tithonius Lacus is dark evident. Of course these are reflected on the RGB image but less contrast. The area of Auroræ Sinus is also well described. However the area around M Erythræum is dark but not so detailed. The Antarctic area is misty due to a result of B.

5 March 2018 ($\lambda=139^\circ\text{Ls}$, $\delta=6.9''$)

CFs continued to give an excellent set of R, G, B components (+an IR 685 image) and the composite RGB image taken at $\omega=020^\circ\text{W}$, $\phi=00^\circ\text{N}$, namely at the same angle as the one he took. For example the R image this time look less contrast, but it cautiously picks up necessary markings. Mare Erythræum may be now surveyed. In RGB, Ophir-Candor shows a bit more reddish tinge. At the Antarctic area a white cloud deviates from the pole and is facing towards us. CFs succeeded in eliminating the ghost line which bothered him on the preceding day.

6 March 2018 ($\lambda=139^\circ\text{Ls}$, $\delta=7.0''$)

The angular diameter reached 7.0 arc-seconds. **MVI** in Melbourne observed on the day at $\omega=234^\circ\text{W}$, $\phi=00^\circ\text{S}$ and produced R,G,B elements and an IR image as well as the RGB composite. Syrtis Mj already out of the morning mist and shows a good shape, just looking slightly bluish. On the northern higher-latitude region, N Alcyonius and Cassius are caught. On the southern hemisphere, Syrtis Minor (Mn) and the NW end of M Cimberium are visible. The southern end of the disk is covered by some morning mist or mist from Hellas. This is well caught by the G image. At the afternoon side, a white cloud looks active at Elysium Mons.

Km made an L-colour image at $\omega=266^\circ\text{W}$ (based on 12 minutes derotation and by the stacking 67,000 frames for the L, and 24,000 frames for the colour. Hellas is nearly at the CM, but not so bright (on the B image at $\omega=275^\circ\text{W}$, it is very bright, but looks very blurred). Syrtis Major shows a normal shape as well as Syrtis Minor. S Sabæus is a bit seen near the morning limb. N Alcyonius, Cassius and Boreosyrtis are barely seen. The area of the npc is hazy. Elysium white cloud is quite near the evening terminator. The associated R image (22 minutes derotation, stacking 123,000 frames) is taken at $\omega=279^\circ\text{W}$ where Yaonis Fr is more explicitly shown (as well as Hellepontus), and hence the outskirts of Hellas is more clearly shown. Otherwise this R image looks to suggest the Huygens crater.

7 March 2018 ($\lambda=140^\circ\text{Ls}$, $\delta=7.0''$)

DPc put forwards an interesting RGB composite together with three ingredients in collaboration with the Chilescope team at $\omega=098^\circ\text{W}$, $\phi=01^\circ\text{S}$. It is notable that Ascræus and Pavonis Montes and Olympus Mons are not yet covered by the orographic clouds (depending on the LT of Montes), while Alba Patera is very cloudy. It is well known that Alba Patera cloud activity shows intensification peaks twice a year, namely around at $\lambda=060^\circ\text{Ls}$ and at $\lambda=140^\circ\text{Ls}$, and hence this time the second peak has been caught. On the other hand, Olympus Mons' cloud achieves a peak around at $\lambda=100^\circ\text{Ls}$, and so around at $\lambda=140^\circ\text{Ls}$, it activity has begun to attenuate. However it must have not yet converged, and so it is expected the white orographic cloud appear as the LT approaches more evening. It will be more interesting if the chase of the cloud developing was performed. However, it is precious to know how Ascræus Mons behaves at

this LT without orographic cloud in a similar way as Olympus Mons. It should be recorded that seen from at $\omega=098^\circ\text{W}$ the evening large cloud occupies until the north of Tithonius Lacus.

NB: As to the fact that the western frank cloud at Olympus Mons grows significantly as it approaches the evening terminator, see for example the excellent images taken by Mark JUSTICE (MJs) on 3 April 2016 ($\lambda=132^\circ\text{Ls}$) at $\omega=157^\circ\text{W}$ and $\omega=172^\circ\text{W}$ (one-hour separated).

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160403/MJs03Apr16.jpg>

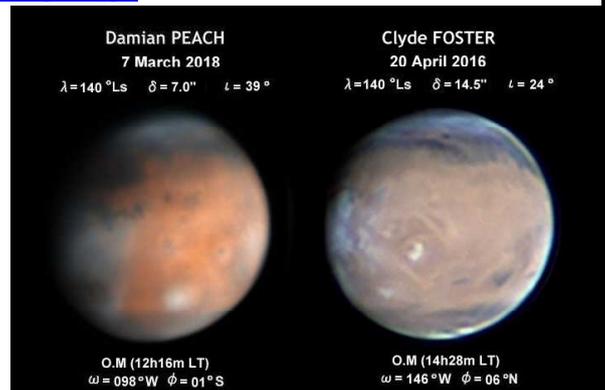
Otherwise, even at $\lambda=140^\circ\text{Ls}$, it is shown by the images in 2016 taken by Clyde FOSTER (CFs):

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160420/CFs20Apr16.jpg>

that at the more evening side an significant orographic cloud appears at the western frank of Olympus Mons:

We shall here show for the purpose of the comparison two images made at $\lambda=140^\circ\text{Ls}$, one made by DPc in 2018 (present case), and the other by CFs in 2016.

MVI composed an excellent RGB image based on the three components taken at $\omega=224^\circ\text{W}$, $\phi=01^\circ\text{S}$. Syrtis Mj has just a bit away from the morning limb, and still bluish. To its south, the whitish Hellas is coming in (very thick in B). Hesperia is seen cut between M Tyrrhenum and M Cimmericum. The dark markings around here are not well detailed, but we can certify the position of the Gale crater due to a good potentiality of the scope. Elysium shows partly a whitish area. The Ætheria dark patch is not well mapped.



8 March 2018 ($\lambda=140^\circ\text{Ls}$, $\delta=7.1''$)

MVI similarly composed an RGB image at $\omega=212^\circ\text{W}$, $\phi=01^\circ\text{S}$. Syrtis Mj may be already inside the disk, but there are seen several ghost around there, and so no explicit say is allowed. Elysium is a bit light near the CM, and since it is thick in G and B, the cloud must be associated with Elysium Mons. Hellas also strong in B. In R a detail of the area of the Gale crater near M Cimmericum is suggested.

9 March 2018 ($\lambda=141^\circ\text{Ls}$, $\delta=7.1''$)

Efrain MORALES (EMr) made an RGB composite at $\omega=081^\circ\text{W}$, $\phi=01^\circ\text{S}$. At first sight, no markings appeals. Just it is supposed that the area of Solis L must be dark, and the northern evening must be governed by M Acidalium. The B image must show some distribution of misty matters, but without more explicit distribution of dark markings we cannot say any further.

10 March 2018 ($\lambda=141^\circ\text{Ls}$, $\delta=7.2''$)

Km put forwards an L-colour image at $\omega=231^\circ\text{W}$, $\phi=01^\circ\text{S}$, based on 4 minutes derotation. Both of the L and colour image are stacked from 24,000 frames. Km also made B image at $\omega=235^\circ\text{W}$, and also R image at $\omega=241^\circ\text{W}$ (14 minutes derotation, 64,000 frames stacked). The L-colour shows Syrtis Mj near the morning limb without an explicit bluish tint. The description of M Cimmericum is not enough. Elysium looks light but the surroundings are quite blurred. The Ætheria dark patch is not definite, a bit darker than N Alcyonius. The colour of the deserts looks appropriate. In R, Syrtis Mj looks extraordinarily dark (why?).

11 March 2018 ($\lambda=142^\circ\text{Ls}$, $\delta=7.2''$)

Km showed an L-colour image at $\omega=220^\circ\text{W}$, $\varphi=01^\circ\text{S}$, based on 17 minutes derotation: The L image is the one stacked from 40,000 frames. The colour image was made similarly as the preceding one. Syrtis Mj is in his time close to the morning limb and looks a bit bluish. M Cimmerium suggests a further detail but not enough. The *Ætheria* dark patch is good from the view-point of the angle, but not detailed. The inside of Elysium is light, Phlegra and Propontis I will be pointed out. The R image is at $\omega=229^\circ\text{W}$, made at a 12 minutes derotation, but even the NW end of M Cimmerium is not enough. N Alcyonius is too soft.

12 March 2018 ($\lambda=142^\circ\text{Ls}$, $\delta=7.3''$)

EMr composed an RGB image at $\omega=044^\circ\text{W}$, $\varphi=02^\circ\text{S}$. A dark area to the east of Solis L, and the area around M Acidalium are just darkly blurred. In B a whitish mist is visible preceding M Acidalium.

Tsutomu ISHIBASHI (Is) obtained an single 290MC colour image at $\omega=205^\circ\text{W}$ by using a 31cm spec. M Cimmerium and a light inside of Elysium are suggested.

14 March 2018 ($\lambda=143^\circ\text{Ls}$, $\delta=7.4''$)

Km made an L-colour image at $\omega=196^\circ\text{W}$, $\varphi=02^\circ\text{S}$: The L image was obtained on the 6 minutes derotation with a stack of 32,000 frames. For the image made at $\delta=7.4''$, the L-colour gives an good impression about the dark markings including M Cimmerium, Trivium Charontis, Propontis I, and the *Ætheria* dark patch. Especially the passage from M Tyrrhenum to M Cimmerium is nicely described. Seeing 4/10. However the connection of the Gale crater to M Cimmerium is never sharp, and the *Ætheria* dark patch does not show a further details. The R image (14 minutes derotation, 56,000 frames stacked) at $\omega=200^\circ\text{W}$ shows all the dark markings as in L but all lack the sharpness.

15 March 2018 ($\lambda=144^\circ\text{Ls}$, $\delta=7.4''$)

DPc gave an single RGB image at $\omega=027^\circ\text{W}$, $\varphi=03^\circ\text{S}$ by the collaboration with the Chilescope team. Meridiani Sinus is visible near at the evening terminator, as well as Brangæna, Oxia P and further spikes until Tithonius L are all shown up, and the markings from M Acidalium to Nilokeras are visible, however they all lack the sharpened definition. A few things which stand out include an explicit evening mist patch which is seen to the north of Meridiani S, and the whitish mist at the high-latitude antarctic region.

16 March 2018 ($\lambda=144^\circ\text{Ls}$, $\delta=7.5''$)

CFs produced and RGB image at $\omega=275^\circ\text{W}$, $\varphi=03^\circ\text{S}$ based on the ingredients of R, G, B images. He also gave an option of IR685 image. Syrtis Mj occupies a good position and The Huygens crater is caught. Yaonis Fr is clearly visible. Hellas also gives a variety of aspects in each colour. The set of three items: Nodus Alcyonius, Cassius and Boreosyrtis are evident. The position of the npc may be witnessed. The IR685 image is similar to the R image, but just the Hellas brightness is much dimmer than on R.

17 March 2018 ($\lambda=145^\circ\text{Ls}$, $\delta=7.5''$)

EMr composed an RGB image at $\omega=010^\circ\text{W}$, $\varphi=03^\circ\text{S}$, and also gave an IR685 image at $\omega=014^\circ\text{W}$. In R it is just suggested that Meridiani S is separated from Margaritifer S, but further details are not suggested. In IR, some further sharpness is shown. B also suggests a vast mist covering around the south pole area.

Km composed an L-colour image at $\omega=162^\circ\text{W}$, $\varphi=03^\circ\text{S}$, based on the L image which is the one stacked of 57,000 frames after using a 10 minutes derotation, and the colour image is the one stacked of 24,000 frames from the 224MC. Seeing was 3~4/10 worth than the preceding case. Mare Sirenum is darkly described in contrast with M Cimmerium. A glimpse of Valhalla is obviously light in brownish tint. Elysium is still near the morning limb. Notable is the white cloud at the western frank of Olympus Mons. The white Olympus cloud is quite standing out, and is shown on the B image at $\omega=166^\circ\text{W}$.

20 March 2018 ($\lambda=146^\circ\text{Ls}$, $\delta=7.7''$)

CFs put forwards an RGB composite at $\omega=228^\circ\text{W}$, $\varphi=04^\circ\text{S}$ together with each ingredient and an IR685 image. The RGB image is an excellent one in the sense the distribution of the density of the dark markings is well shown. The bright part of Elysium is made of a whitish part and a reddish one. The white part is concentrated at the position of Elysium Mons. The Ætheria dark patch is not well shown but the spilt part is suggested. The small area of Osiridis Prom is bright at the eastern corner of Syrtis Mj. The Antarctic area is shown irregularly beautiful with the whitish matter which must be connected with the morning Hellas. The connector (leg) of the Gale crater with M Cimmerium is weak but distinct. N Alcyonius is definite, and its density compares favourably with the dark patch at Ætheria.

DPc obtained a single RGB image at $\omega=318^\circ\text{W}$, $\varphi=04^\circ\text{S}$ by the collaboration with the Chilescope team. Syrtis Mj and Sinus Sabæus are shown up, but without details. At the evening northern part of Syrtis Mj shows a whitish zone. The southern limb side is hazy.

21 March 2018 ($\lambda=147^\circ\text{Ls}$, $\delta=7.8''$)

MVI made an RGB composite at $\omega=091^\circ\text{W}$, $\varphi=04^\circ\text{S}$ based on his three ingredients. MVI also obtained an IR image at $\omega=090^\circ\text{W}$. The RGB' s tint of the deserts is beautiful in contrast with the blue whitish haze over the south polar area. As the dark markings, Solis Lacus is identifiable and Tithonius Lacus shows up with some details. Ophir-Candor is a bit light in R and IR. Tharsis Montes look to show their summits as shadowy spots. M Acidalium is not so distinct, partially whitish misty, just lying down near the evening terminator. The B image appears nice because of the luxuriant description of the southern limb haze, and the evening cloud following M Acidalium.

22 March 2018 ($\lambda=147^\circ\text{Ls}$, $\delta=7.9''$)

Km gave an L-colour image at $\omega=106^\circ\text{W}$, $\varphi=04^\circ\text{S}$: The L image is the one made stacked of 48,000 frames based on a 10 minutes derotation, while the 224MC colour image is the one made stacked from 24,000 frames. Otherwise Km gave a B image at $\omega=115^\circ\text{W}$ (7 minutes derotation, 12,000 frames stacked). Seeing 3~4/10. On the L-colour image, such dark markings as Solis L and Tithonius L are distinctively gathered near the evening terminator, and M Sirenum is detected at the rather morning side. Positions of Tharsis Montes are suggested (though not so clear), and Olympus Mons, not yet cloudy, shows a bit light initial state of the orography.

23 March 2018 ($\lambda=148^\circ\text{Ls}$, $\delta=7.9''$)

Km obtained an L-colour image at $\omega=090^\circ\text{W}$, $\varphi=05^\circ\text{S}$, based on the high-L image which was stacked from 62,000 frames obtained by a 11 minutes derotation as well as based on a 224MC colour produced by stacking of 24,000 frames. Seeing was 4~5/10. This L-colour image is highly favourable: Solis Lacus is, al-

ready near the evening terminator, well dark and definite reminding us of its earlier fame. To its north, Agathodæmon is not definite, but Tithonius L is completely represented. Ophir-Candor is well light. We can also trace the markings such as Nilokeras and Lunæ Lacus, though Mare Acidalius is already beyond the terminator. On the morning side, it will be possible to trace Tharsis Montes: Phœnicis Lacus adjoins Arsia Mons. To the north of Arsia Mons, Pavonis Mons, and Ascræus Mons may be pinned down. Olympus Mons is not light yet. Around at the south pole, a large haze covers and its thin part looks to go down to the south of Solis L. The R image (10 minutes derotation, composite of 62,000 frames) was made at $\omega=097^\circ\text{W}$ where Mare Sirenum clearly shot.

25 March 2018 ($\lambda=149^\circ\text{Ls}$, $\delta=8.0''$)

NB: The angular diameter δ of the planet now attained 8 seconds of arc. **DPc** continues to secure the three R, G, B ingredients and an RGB composite at $\omega=298^\circ\text{W}$, $\phi=05^\circ\text{S}$ in remote control coöperation with the Chilescope team. Any of these images looks individual. Sinus Meridiani is still close to the morning limb, while Aryn's nails are evident. However, such fretum as Yaonis Fr is not evident near the CM. Hellas is never thick; just the southern part appears misty. Syrtis Major looks fat and large; its northern end is quite flat, looking like a ship's bottom. A northern zone of Syrtis Mj ($05^\circ\text{N}\sim 15^\circ\text{N}$) is misty, as quite evident in B. This fact brings a bit bluish tint to the northern zone of Syrtis Mj. Furthermore, the G image shows quite an interesting fact that an area at the northern end of Syrtis Mj near the ship's bottom like is outside of the thick mist, so that the bottom is shadowy in G (less in B). The R image suggests a core of the Huygens crater. Note also that the eastern part of Noachis is dark/shadowy: This is so on every R, G, B. Nodus Alcyonius is definite in a good shape.

Km obtained an L image by stacking 62,000 frames secured with a 10 minutes derotation as well as a 224MC colour by stacking 24,000 frames and finally produced an L-colour image at $\omega=086^\circ\text{W}$, $\phi=05^\circ\text{S}$. Seeing was 4~5/10. Solis L is not well disposed, just suggests a relation with Aonius Sinus. Tithonius L is perfectly trapped, and Ophir is light. Nilokeras is visible. Phœnicis L adjoins Arsia Mons.

26 March 2018 ($\lambda=150^\circ\text{Ls}$, $\delta=8.1''$)

Is sent us two images at $\omega=056^\circ\text{W}$ and at $\omega=057^\circ\text{W}$. However we don't see any definite marking to compare.

Km composed an L image by stacking 57,000 frames obtained from 11 minutes derotation and then by stacking 24,000 frames of 224MC colour images and finally composed an L-colour image at $\omega=068^\circ\text{W}$, $\phi=05^\circ\text{S}$. Seeing 4~5/10. Solis Lacus is nicely shown largely protruding to the CM. However the image does not look colourful, and we wonder how and why Solis L is so much black. Thaumasia also looks blocked-up shadows. Tithonius L is definite though slightly blurred. Ophir-Candor is a bit lighter along Ganges. The area of Auroræ S is now more inside. On the northern hemisphere, Nilokeras shows up. M Acidalius is going away while the bottom remains dark. The R stacked image at $\omega=076^\circ\text{W}$, obtained from 48,000 frames through a 19 minutes derotation, may be more informational because R is here sensitive in showing several shadowy dots in good contrast so that Thaumasia naturally shades. Phœnicis L, Arsia Mons and northern Tharsis Montes are suggested.

27 March 2018 ($\lambda=150^\circ\text{Ls}$, $\delta=8.1\sim 8.2''$)

EMr composed an RGB image at $\omega=274^\circ\text{W}$, $\phi=05^\circ\text{S}$. EMr also added an IR685 image. Syrtis Mj is near

the CM, and its preceding neighbourhood is light. Is it because of a mist patch? Cassius is evident. However Nodus Alcyonius does not show up. Hellas is whitish because of B, and it appears the whitish mist goes down to Syrtis Mj.

DPc presented an interesting set of the remote sensing images (three colour ingredients and an RGB composite) in collaboration with Chilescope team at $\omega=280^\circ\text{W}$, $\varphi=05^\circ\text{S}$. On the RGB composite, Hellas's icy deposit part looks to have entered the final stage. In B, Hellas's white part shows a strange structure. The R image shows Meridiani S is just on the morning limb. The inside of Syrtis Mj has now become somewhat conspicuous, and hence some unevenness at the western coast can now be identified: For example, they include the Schröeter crater as well as the Huygens crater. The area of M Tyrrhenum is near the evening terminator, and looks shadowy. N Alcyonius, Cassius and Boreosyrtis are definite. In R, Yaonis Fr is definitely dark. In B the northern half of Syrtis Mj vanishes, and in RGB slightly bluish.

Km obtained an L-colour image at $\omega=056^\circ\text{W}$, $\varphi=05^\circ\text{S}$ where the L image is a stacked image of 52,000 frames secured during the 10 minutes derotation, and the 224MC colour is a result stacked from 24,000 frames. Seeing was 3~4/10. Solis L is now more morning side, but just dark. Tithonius L looks also blurred. Thaumasia can be identified in the R image (14 minutes derotation, stacked of 66,000 frames). In R, Nilokeras is described much finer. The bottom of M Acidalius is dark though it is near at the evening terminator. The markings in R show much nicer definition concerning sharpness than those in L.

28 March 2018 ($\lambda=150\text{--}151^\circ\text{Ls}$, $\delta=8.2''$)

DPc氏 produced an RGB image in cooperation with the Chilescope team at $\omega=250^\circ\text{W}$, $\varphi=06^\circ\text{S}$ (single image). The north-west end of M Cimberium, Syrtis Minor and Syrtis Major are largely seen, but without higher details. The area of Hellas is softly blue-whitish. On the northern hemisphere, N Alcyonius is an eye-catching point. The Ætheria dark patch is not detailed. The orographic cloud at Elysium Mons looks active near the terminator.

Km secured an L-colour image at $\omega=050^\circ\text{W}$, $\varphi=05^\circ\text{S}$ from an L image and the 224MC colour image obtained as follows: The L is a stacked image of 52,000 frames taken from the 20 minutes derotation and the 224MC colour is the one stacked from 24,000. Seeing on the wane 2~4/10. The region from Solis L to Auroræ S can be identified, but all markings look blurred. Even Mare Acidalius is not legible. On the contrary, the stacked R image (66,000 frames secured during 22 minutes derotation) made at $\omega=058^\circ\text{W}$ shows the markings more clearly and they are all more impressible. The shape of Solis Lacus reminds us of its former figure (around 1986~1988), the spikes at around S Auroræ look real. The two nails at Nilokeras are nicely shown up. If these could be shown in a black-and-white picture, these could be described in an amazing gradation.

29 March 2018 ($\lambda=151^\circ\text{Ls}$, $\delta=8.3''$)

DPc put forwards an RGB composite at $\omega=256^\circ\text{W}$, $\varphi=06^\circ\text{S}$ in a cooperation with the Chilescope-team. Syrtis Mj is largely shown, but without details. Maybe a misty band at the equatorial zone affects the northern part of Syrtis Mj to appear to be slightly bluish. To the south of Hellas a large mist covers, and the cloud at Elysium Mons looks active near the terminator.

MVI composed an RGB image at $\omega=360^\circ\text{W}$, $\varphi=06^\circ\text{S}$, based on the tri colour ingredients. MVI also

added an IR image taken at $\omega=003^\circ\text{W}$. The RGB composite image gives us a round and agreeable impression. In R in which MVI tried to eliminate any ghost around Sinus Meridiani, Brangæna is quite faint, but the nuance in R has been well taken over in RGB. Oxia Palus is also nicely processed, and the slightly reddish desert to the north of Sinus Meridiani is well caught together with Oxus and its westwards dull light zone. Mare Acidalium is now inside the disk as if it's a flat face with a darker bottom at the NW corner. The south polar mist looks to be made of multiple layers, and one of them goes down to Argyre. These layers must not be caught by B only but also the G image looks to work. We should say the present images must have been elaborately produced.

30 March 2018 ($\lambda=152^\circ\text{Ls}$, $\delta=8.3\sim 8.4''$)

DPc shows here an RGB image at $\omega=249^\circ\text{W}$, $\varphi=06^\circ\text{S}$ and its ingredients which are all obtained in collaboration with the Chilescope team. The angular diameter was $\delta=8.3''$. The seeing condition must have been a bit improved, so that the NW end of M Cimmerium is more detailed, and the two bridges which connect the Gale and Knobel craters with M Cimmerium. It also shows that the Ætheria dark patch is clearly split to two. The southern Ausonia is reddish. The orographic cloud at Elysium Mons is thick and active near the terminator. The B image proves that the mist at equatorial zone is still spread around at 10°N . In R there are seen several vertical segments in the northern Ausonia.

During **Km's** time the angular diameter turned to $\delta=8.4''$. Km obtained an L image by stacking 48,000 frames which secured by 11 minutes derotation, and similarly 224MC colour image by stacking 24,000 frames and finally got an L-colour image at $\omega=027^\circ\text{W}$, $\varphi=06^\circ\text{S}$. Seeing was 2~4/10. Although M Acidalium is located near the CM, it appears quite weak because the upper half of M Acidalium looks to be covered by a haze. S Meridiani looks to show two nails. Oxia Palus is quite dark. Ophir looks light to the west of Auroræ S. Solis L is not well separated, but its latitude is a dark band from west to east. Km also gives an R stacked image at $\omega=040^\circ\text{W}$. In this R, Soils L makes a dark figure.

31 March 2018 ($\lambda=152^\circ\text{Ls}$, $\delta=8.4''$)

DPc put forwards finally an excellent RGB images and its ingredients in collaboration with the Chilescope team at $\omega=249^\circ\text{W}$, $\varphi=06^\circ\text{S}$. Syrtis Mj is completely inside the disk, and shows a bit bluish tinge. The detail which first draws our attention is the one concerning the NW end of Mare Cimmerium. The Hershel crater joins explicitly now to the Gale and the Knobel crater. To the further NW direction, there are seen several minor spots or segments. The details are to be checked on the R image. Nodus Alcyonius is quite evident and darker than the preceding Ætheria dark patch whose upper part is split and weak in density. Inside Elysium, there governs two colours: one is ground-lit colour and the other is the colour of white covering Elysium Mons. The southern coast of Utopia is also detailed. At the Antarctic area, the white mist which must be related with Hellas thickly covers. To its north, the southern Ausonia is seen reddish.

Km obtained an L image stacked of 67,000 frames which got from 10 minutes derotation and then he obtained a 224MC colour image by stacking 24,000 frames and finally got an L-colour image at $\omega=009^\circ\text{W}$, $\varphi=06^\circ\text{S}$. Seeing was 4~5/10, better than the preceding case. The L-colour looks soft, and although Sinus Meridiani shows the nails, Brangæna is not detected. Margaritifer S is also quite fainter and rather the areas at the higher latitudes are darker. There may exist a dust expansion between Margaritifer S and

Auroræ S. M Acidalium is large but fainter than usual. The associated R image at $\omega=016^\circ\text{W}$ (by stacking 50,000 frames from 12 minutes derotation) shows much details about the markings. M Acidalium shows in R some delicate gradation of the shadowy parts. This R may prove a light dust streak around at Pyrrhæ Regio. - - -

Forthcoming 2018 Mars (#06)

Ephemeris for the Observations of the 2018 Mars. IV

May & June 2018

By

Masami MURAKAMI

AS a sequel to the preceding list of the Ephemeris for the physical observations of Mars, we here list up the necessary elements of the Ephemeris for the period from 1 May 2018 to 30 June 2018. The data are listed for every day at 00:00 GMT (not TDT). The symbols ω and ϕ denote the Longitude and Latitude of the sub-Earth point respectively. The symbols λ , δ and ι stand for the Areocentric Longitude of the Sun, the Ap-

parent Diameter and the Phase Angle respectively. We also add the column of the Position Angle Π of the axis rotation, measured eastwards from the north point: This is useful when we try to determine the north pole direction from the $p \leftarrow \rightarrow f$. The Apparent Declination of the planet is also given at the final column (denoted D). The data here are basically based on *The Astronomical Almanac for the Year 2018*.

Date (00:00GMT)	ω	ϕ	λ	δ	ι	Π	D
01 May 2018	152.62°W	12.05°S	168.05°Ls	11.08"	40.2°	13.5°	-22°41'
02 May 2018	143.08°W	12.20°S	168.59°Ls	11.19"	40.1°	13.2°	-22°39'
03 May 2018	133.54°W	12.34°S	169.14°Ls	11.30"	40.0°	12.9°	-22°37'
04 May 2018	124.00°W	12.49°S	169.68°Ls	11.42"	39.9°	12.6°	-22°34'
05 May 2018	114.47°W	12.63°S	170.23°Ls	11.53"	39.8°	12.4°	-22°32'
06 May 2018	104.94°W	12.77°S	170.77°Ls	11.64"	39.7°	12.1°	-22°29'
07 May 2018	095.41°W	12.90°S	171.32°Ls	11.76"	39.6°	11.8°	-22°27'
08 May 2018	085.89°W	13.03°S	171.87°Ls	11.88"	39.5°	11.5°	-22°24'
09 May 2018	076.37°W	13.15°S	172.42°Ls	12.00"	39.3°	11.2°	-22°22'
10 May 2018	066.85°W	13.28°S	172.97°Ls	12.12"	39.2°	11.0°	-22°20'
11 May 2018	057.34°W	13.39°S	173.52°Ls	12.25"	39.1°	10.7°	-22°17'
12 May 2018	047.83°W	13.51°S	174.08°Ls	12.38"	39.0°	10.4°	-22°15'
13 May 2018	038.33°W	13.62°S	174.63°Ls	12.50"	38.8°	10.2°	-22°13'
14 May 2018	028.83°W	13.73°S	175.18°Ls	12.63"	38.7°	9.9°	-22°10'
15 May 2018	019.33°W	13.83°S	175.74°Ls	12.77"	38.5°	9.7°	-22°08'
16 May 2018	009.84°W	13.93°S	176.30°Ls	12.90"	38.4°	9.4°	-22°06'
17 May 2018	000.36°W	14.03°S	176.85°Ls	13.04"	38.2°	9.1°	-22°04'
18 May 2018	350.88°W	14.13°S	177.41°Ls	13.17"	38.0°	8.9°	-22°02'
19 May 2018	341.40°W	14.22°S	177.97°Ls	13.31"	37.8°	8.7°	-22°00'
20 May 2018	331.93°W	14.31°S	178.54°Ls	13.46"	37.7°	8.4°	-21°58'
21 May 2018	322.47°W	14.39°S	179.10°Ls	13.60"	37.5°	8.2°	-21°56'
22 May 2018	313.01°W	14.48°S	179.66°Ls	13.74"	37.3°	7.9°	-21°55'
23 May 2018	303.56°W	14.55°S	180.23°Ls	13.89"	37.1°	7.7°	-21°53'
24 May 2018	294.11°W	14.62°S	180.79°Ls	14.04"	36.9°	7.5°	-21°51'
25 May 2018	284.67°W	14.69°S	181.36°Ls	14.19"	36.6°	7.3°	-21°50'
26 May 2018	275.24°W	14.76°S	181.92°Ls	14.34"	36.4°	7.0°	-21°49'
27 May 2018	265.81°W	14.82°S	182.49°Ls	14.50"	36.2°	6.8°	-21°47'

Date (00:00GMT)	ω	ϕ	λ	δ	ι	Π	D
28 May 2018	256.39°W	14.87°S	183.06°Ls	14.66"	35.9°	6.6°	-21°46'
29 May 2018	246.98°W	14.93°S	183.62°Ls	14.81"	35.7°	6.4°	-21°45'
30 May 2018	237.57°W	14.98°S	184.19°Ls	14.97"	35.4°	6.2°	-21°44'
31 May 2018	228.17°W	15.02°S	184.76°Ls	15.14"	35.1°	6.0°	-21°44'
01 June 2018	218.78°W	15.06°S	185.34°Ls	15.30"	34.8°	5.8°	-21°43'
02 June 2018	209.39°W	15.09°S	185.91°Ls	15.47"	34.5°	5.6°	-21°42'
03 June 2018	200.01°W	15.13°S	186.48°Ls	15.63"	34.2°	5.4°	-21°42'
04 June 2018	190.64°W	15.15°S	187.06°Ls	15.81"	33.9°	5.3°	-21°42'
05 June 2018	181.28°W	15.18°S	187.63°Ls	15.98"	33.6°	5.1°	-21°42'
06 June 2018	171.93°W	15.20°S	188.21°Ls	16.16"	33.2°	4.9°	-21°42'
07 June 2018	162.59°W	15.22°S	188.78°Ls	16.33"	32.9°	4.8°	-21°42'
08 June 2018	153.25°W	15.23°S	189.36°Ls	16.51"	32.5°	4.6°	-21°43'
09 June 2018	143.93°W	15.23°S	189.94°Ls	16.69"	32.2°	4.5°	-21°43'
10 June 2018	134.61°W	15.24°S	190.52°Ls	16.87"	31.8°	4.3°	-21°44'
11 June 2018	125.31°W	15.24°S	191.10°Ls	17.05"	31.4°	4.2°	-21°45'
12 June 2018	116.01°W	15.23°S	191.69°Ls	17.24"	31.0°	4.1°	-21°47'
13 June 2018	106.73°W	15.22°S	192.27°Ls	17.43"	30.6°	3.9°	-21°48'
14 June 2018	097.45°W	15.20°S	192.86°Ls	17.61"	30.1°	3.8°	-21°49'
15 June 2018	088.19°W	15.19°S	193.44°Ls	17.80"	29.7°	3.7°	-21°51'
16 June 2018	078.94°W	15.16°S	194.03°Ls	17.99"	29.3°	3.6°	-21°53'
17 June 2018	069.69°W	15.13°S	194.62°Ls	18.18"	28.8°	3.5°	-21°55'
18 June 2018	060.46°W	15.09°S	195.20°Ls	18.37"	28.4°	3.4°	-21°58'
19 June 2018	051.24°W	15.06°S	195.79°Ls	18.56"	27.9°	3.4°	-22°00'
20 June 2018	042.03°W	15.01°S	196.38°Ls	18.76"	27.4°	3.3°	-22°03'
21 June 2018	032.83°W	14.97°S	196.97°Ls	18.95"	26.9°	3.2°	-22°06'
22 June 2018	023.64°W	14.92°S	197.56°Ls	19.15"	26.3°	3.2°	-22°10'
23 June 2018	014.47°W	14.87°S	198.15°Ls	19.34"	25.8°	3.1°	-22°13'
24 June 2018	005.31°W	14.81°S	198.74°Ls	19.53"	25.3°	3.1°	-22°17'
25 June 2018	356.15°W	14.75°S	199.34°Ls	19.73"	24.7°	3.1°	-22°20'
26 June 2018	347.01°W	14.68°S	199.93°Ls	19.92"	24.2°	3.0°	-22°24'
27 June 2018	337.88°W	14.62°S	200.52°Ls	20.11"	23.6°	3.0°	-22°29'
28 June 2018	328.77°W	14.54°S	201.12°Ls	20.30"	23.0°	3.0°	-22°33'
29 June 2018	319.66°W	14.46°S	201.72°Ls	20.49"	22.4°	3.0°	-22°38'
30 June 2018	310.57°W	14.38°S	202.31°Ls	20.68"	21.8°	3.0°	-22°43'
01 July 2018	301.49°W	14.30°S	202.91°Ls	20.87"	21.2°	3.0°	-22°48' - - -

Letters to the Editor

●.....*Subject: Mars 16 March 2018 0229UT RGB and IR*
Received: 17 March 2018 at 15:10 JST

Hi all, I am afraid my imaging schedule has been heavily impacted over the last 5 weeks as I spent substantial time at the bedside of my Dad (92) who peacefully slipped away from us on Monday. It was he who nurtured my early interest in astronomy and bought me my first small refractor when I was about 9 years old, living in Scotland. I've got noth-

ing but gratitude and appreciation for all he did for me and my family- he will be sorely missed.

I returned home on Thursday and managed to catch Mars under average conditions yesterday morning, with the Hellas Basin again showing some interesting features. Possibly some dust in the right of the basin, and bright cloud or ice upper left.

Best regards, Clyde

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2018/180316/CFs16Mar18.png>

○.....*Subject: Mars 20 March 2018 0216UT RGB and IR*
Received: 20 March 2018 at 12:39 JST

Hi all, Mars this morning. Elysium at lower left.

Best regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180320/CFs20Mar18.png>

○...**Subject: Mars 7 March 2018 0258UT RGB and IR**
Received: 7 April 2018 at 19:06 JST

Hi all, We returned home on Wednesday from our wedding and honeymoon, which I hope draws to a close a period of nearly two months where my planetary imaging was heavily disrupted. Over this time, and during a period of torrential rainfall, the motorised roll-off roof of my observatory mysteriously opened by itself, exposing the C14 and mount to the deluge. The scope and mount have been stripped and cleaned and are currently being tested, and there is a possibility I may have them back over this weekend.

In the meantime, I have rather rapidly reinstalled my previous Meade 12" ACF back in the observatory. Polar alignment has not been fine-tuned, and collimation is also not perfect at this stage. But at least I was able to capture the attached RGB and IR images of Mars this morning, with the South Polar Hood prominent. The Vallis Marineris complex is just above the centre of the image. Seeing was below average. Best regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180407/CFs07Apr18.png>

○...**Subject: Mars 14 April 2018 0242UT RGB and IR**
Received: 14 April 2018 at 17:46 JST

Hi all, What a pleasure, and a huge relief, to have the C14 back in the observatory after having been exposed to extensive rainfall a few weeks ago.

Some interesting structure to the south polar cloud formations. Following the last two, highly disrupted months, I am hoping that I can now settle into a routine for the coming months. Best regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180414/CFs14Apr18.png>

○...**Subject: Mars 15 April 2018 0032UT RGB and IR**
Received: 16 April 2018 at 02:24 JST

Hi all, Despite Meteoblue projecting very poor seeing conditions, I was up a bit earlier to try and catch the polar storm on Saturn, so Mars was at a lower altitude for these captures. Some cloud and two dark spots appear to be in Hellas, although it also appears that there is a section of the basin that is clear of ice/cloud. Best regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180414/CFs14Apr18.png>

Clyde FOSTER (Centurion, SOUTH AFRICA)

●...**Subject: Mars good seeing (Feb 22nd.)**
Received: 18 March 2018 at 07:03 JST

Hi all, Good seeing on the 22nd allowed an excellent view of the Elysium hemisphere. The famous Gale crater (location of curiosity rover) is located at the end of the longer of the tuning fork prongs of Sinus Gomer which are clearly visible at lower centre.

http://www.damianpeach.com/mars2018/m2018_02_22dp.jpg

Amazing to think that Mars will be almost four times as wide as this by the end of July. We are in for a real treat! Best Wishes

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180222/DPc22Feb18.png>

○...**Subject: A different view of Mars (March 18th.)**
Received: 19 March 2018 at 07:12 JST

Hi all, A rather wider view of Mars for this image. Today (and tomorrow) it passes directly between M8 (Lagoon) and M20 (Trifid) nebulae in Sagittarius. Here is the view captured on March 18th with Mars approaching the mid way point between these two famous celestial targets.



http://www.damianpeach.com/deepsky/m8_20_mars_2018_03_18dp.jpg

Takahashi FSQ106 with FLI CCD. HaLRGB. 1.5hrs total. Best Wishes

○...**Subject: Mars images (Feb 23rd.)**
Received: 21 March 2018 at 08:02 JST

Hi all, Fair seeing on the 23rd with Syrtis Major very close to the limb (with a striking example of the Syrtis blue cloud.) Best Wishes,

http://www.damianpeach.com/mars2018/m2018_02_23dp.jpg

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180223/DPc23Feb18.png>

○...**Subject: Mars image (Feb 24th.)**

Received: 23 March 2018 at 21:19 JST

Hi all, Poor seeing on the 24th. Elysium is bright with clouds. Best Wishes

http://www.damianpeach.com/mars2018/m2018_02_24dp.jpg

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180224/DPc24Feb18.png>

○...**Subject: Mars image (Feb 25th.)**

Received: 24 March 2018 at 08:42 JST

Hi all, Very poor seeing for this one on Feb 25th. Best Wishes

http://www.damianpeach.com/mars2018/m2018_02_25dp.jpg

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180225/DPc25Feb18.png>

○...**Subject: Mars image (March 1st.)**

Received: 25 March 2018 at 06:13 JST

Hi all, Very poor seeing for this one. Brilliant clouds over Tharsis on the terminator. Best Wishes

http://www.damianpeach.com/mars2018/m2018_03_01dp.jpg

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180301/DPc01Mar18.png>

○...**Subject: Mars images (March 25th.)**

Received: 26 March 2018 at 01:27 JST

Hi all, Here are some Mars images from this morning. Poor to average seeing, though the B filter image was good. Best Wishes

http://www.damianpeach.com/mars2018/m2018_03_25b_dp.jpg

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180325/DPc25Mar18.png>

○...**Subject: Mars images (March 2nd.)**

Received: 27 March 2018 at 02:40 JST

Hi all, Here is an image from the 2nd. Average seeing. Dense clouds over Tharsis. Olympus Mons flanked with clouds just left of centre. Best Wishes

http://www.damianpeach.com/mars2018/m2018_03_02dp.jpg

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180302/DPc02Mar18.png>

○...**Subject: Mars images (March 30th.)**

Received: 3 April 2018 at 00:43 JST

Hi all, Here are some images from March 30th under average seeing. Syrtis Major and Elysium are prominent. Best Wishes

http://www.damianpeach.com/mars2018/m2018_03_30dp.jpg

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180330/DPc30Mar18.png>

○...**Subject: Mars images (March 3rd.)**

Received: 7 April 2018 at 06:36 JST

Hi all, Here is an image from the 3rd. Poor seeing. Dense clouds over Tharsis. Best Wishes

http://www.damianpeach.com/mars2018/m2018_03_03dp.jpg

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180303/DPc03Mar18.png>

○...**Subject: Mars, Saturn with M22 (March 31st.)**

Received: 7 April 2018 at 21:55 JST

Hi all, Here is a widefield image of the conjunction between Mars, Saturn and globular cluster M22 which happened some days back. Titan can be seen just below Saturn in the image.



http://www.damianpeach.com/deepsky/mars_saturn_m22_2018_03_31dp.jpg

Best Wishes

○...**Subject: Mars images (March 7th.)**

Received: 8 April 2018 at 17:57 JST

Hi all, Fair seeing on the 7th. A nice view of Solis Lacus and the Tharsis volcanoes. Brilliant orographic cloud over Alba Patera. Best Wishes

http://www.damianpeach.com/mars2018/m2018_03_07dp.jpg

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180307/DPc07Mar18.png>

○...**Subject: Mars images (March 15th.)**

Received: 10 April 2018 at 06:41 JST

Hi all, Here is a Mars image from March 15th. Very poor seeing. Best Wishes

http://www.damianpeach.com/mars2018/m2018_03_15dp.jpg

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180315/DPc15Mar18.png>

○...**Subject: Mars good seeing (March 31st.)**

Received: 11 April 2018 at 05:24 JST

Hi all, Good seeing on March 31st resulting in the best images obtained so far this apparition. Elysium is just right of centre with clouds extending northward from it. South polar cap boundary can be seen. Some very fine surface details seen for the diameter. Best Wishes

http://www.damianpeach.com/mars2018/m2018_03_31dp.jpg

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180331/DPc31Mar18.png>

○...**Subject: Mars images (March 20th.)**

Received: 12 April 2018 at 04:44 JST

Hi all, Poor seeing on the 20th. Syrtis Major is nicely seen with a bluish cloud over it. Best Wishes

http://www.damianpeach.com/mars2018/m2018_03_20dp.jpg
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180320/DPc20Mar18.png>

○.....**Subject: Mars images (March 27th.)**
Received: 14 April 2018 at 06:21 JST

Hi all, Here are some images from March 27th. Average seeing. Interesting to note how the southern half of Hellas looks frosted while the northern half of the basin looks clear. Best Wishes

http://www.damianpeach.com/mars2018/m2018_03_27dp.jpg
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180327/DPc27Mar18.png>

○.....**Subject: Marfps images (March 28th.)**
Received: 15 April 2018 at 06:30 JST

Hi all, Here is an image from the 28th. Poor seeing. Best Wishes

http://www.damianpeach.com/mars2018/m2018_03_28dp.jpg
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180328/DPc28Mar18.png>

Damian PEACH (Selsey, WS, the UK)
 Web: <http://www.damianpeach.com/>

●.....**Subject: Mars 2018/03/17-Kumamori**
Received: 18 March 2018 at 17:46 JST

Dear Masatsugu MINAMI: The sky was fine due to a presence of a migratory anticyclone, but the air turbulence is violent. The R image was poorer, though the L component was so and so. Recently the seeing condition is quite unstable.

With best wishes,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180317/Km17Mar18.png>
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180322/Km22Mar18.png>
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180323/Km23Mar18.png>

○.....**Subject: Mars 2018/03/25-Kumamori**
Received: 26 March 2018 at 20:50 JST

Dear Masatsugu: the fine sky visits, but the transparency remains very poor, though the seeing was so and so.. Best wishes.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180325/Km25Mar18.png>

○.....**Subject: Mars 2018/03/27-Kumamori**
Received: 28 March 2018 at 19:02 JST

Dear MINAMI: The sky from the ground continues to be fine, but the seeing condition was poorer. At dawn, the temperature pointed 12°C: So we should say it has become quite warmer.

With best wishes,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180327/Km27Mar18.png>

○.....**Subject: Mars 2018/03/28-Kumamori**

Received: 29 March 2018 at 20:27 JST

Dear MINAMI. I have been rather tired because the sky continues to be clear. However the seeing condition was not so improved. The repeating of the improved seeing and very poor seeing makes me more excessively tired. With best wishes,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180328/Km28Mar18.png>

○.....**Subject: Mars 2018/03/30-Kumamori**
Received: 31 March 2018 at 17:25 JST

Dear MINAMI: Oddly enough, the sky continues to be clear, while the seeing condition does never improve. The image processing is not yet stable. But soon the δ will reach 10", and so I hope my technique will improve more. With best wishes.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180330/Km30Mar18.png>

○.....**Subject: Mars 2018/03/31-Kumamori**
Received: 2 April 2018 at 18:45 JST

Dear MINAMI: Some fine skies often visit, but the poor transparency condition continues. This time the condition has a bit improved.

Best wishes

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180331/Km31Mar18.png>

○.....**Subject: Mars 2018/04/02-Kumamori**
Received: 3 April 2018 at 21:21 JST

Dear MINAMI: Not well stable, but the seeing looks better after a while. When watching through R filters, some marking clearly visible on the monitor. Best

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180402/Km02Apr18.png>

○.....**Subject: Mars 2018/04/09-Kumamori**
Received: 10 April 2018 at 21:37 JST

Dear MINAMI, Since yesterday, the seeing status recovered. It was clearly noticed some part of the south pplar cloud shows a dent.

With best wishes,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180409/Km09Apr18.png>

Teruaki KUMAMORI (Osaka, JAPAN)

●.....**Subject: Mars 21st March 2018**
Received: 24 March 2018 at 11:54 JST

Hello all, Attached is an image set of Mars taken on the 21st March UT in below average seeing. regards

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180321/MVI21Mar18.png>

○.....**Subject: Mars 29th March UT**

Received: 31 March 2018 at 07:14 JST

Hello all, Attached is an image set of Mars taken on the 29th March UT in below average seeing conditions. Best wishes

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180329/MVI29Mar18.png>

○.....**Subject: Mars 2nd April UT**

Received: 3 April 2018 at 08:50 JST

Hello All, Attached is an image set of Mars taken on the 2nd April UT in below average to poor seeing conditions. Best wishes

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180402/MVI02Apr18.png>

Maurice VALIMBERTI
(Melbourne, AUSTRALIA)

●.....**Subject: NYTimes: Van Gogh Never Visited Japan, but He Saw It Everywhere**

Received: 26 March 2018 at 23:32 JST

Here's a story from The New York Times that I thought you'd find interesting: After buying some prints in Paris in 1886, the Dutch painter became obsessed by Japanese art. An exhibition in Amsterdam explores how that fascination shaped his work. Read More...

<https://www.nytimes.com/2018/03/26/arts/design/vincent-van-gogh-japan.html>

Get The New York Times on your mobile device

<http://www.nytimes.com/services/mobile/index.html>

Sent from my iPhone

Bill SHEEHAN (Flagstaff, AZ)

●.....**Subject: Mars**

Received: 30 March 2018 at 05:075 JST

Hi Mr. Minami and All!, Here I submit my latest session and some that were submitted but not posted.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180327/EMr27Mar18.png>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180317/EMr17Mar18.png>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180312/EMr12Mar18.png>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180309/EMr09Mar18.png>

○.....**Subject: Mars - April 1st**

Received: 4 April 2018 at 03:44 JST

Hi Mr. Minami and All!, Here I submit my latest session from april 1st.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180401/EMr01Apr18.png>

Efrain MORALES RIVERA
(Aguadilla, Puerto Rico)

●.....**Subject: Mars image on 1 April 2018**

Received: 5 April 2018 at 00:15 JST

I am Tomio AKUTSU from Ibaraki. This is an image of the planet Mars taken on 1st April 2018, Best regards

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180401/Ak01Apr18.png>

○.....**Subject: Mars images on 13 April 2018**

Received: 15 April 2018 at 22:02 JST

This is an image of the planet Mars taken on 13 April 2018. With best regards,

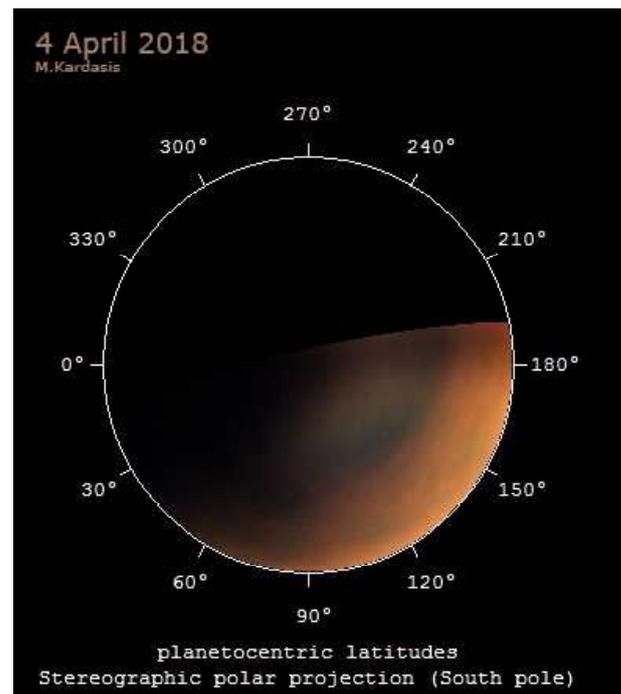
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180413/Ak13Apr18.png>

Tomio AKUTSU (Ibaraki, JAPAN)

●.....**Subject: Mars 2018/04/03 & 04**

Received: 5 April 2018 at 03:33 JST

Hello here are my first sets of Mars for 2018 in average conditions:



<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180403/MKd03Apr18.png>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180404/MKd04Apr18.png>

○.....**Subject: Mars 2018/04/05**

Received: 5 April 2018 at 18:56 JST

Hello, here is an observation in average conditions:

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2018/180405/MKd05Apr18.png>

Manos KARDASIS (Glyfada-Athens, GREECE)

Mars 2018: <http://kardasis.weebly.com/mars-2018.html>



À La Carte
Masami MURAKAMI

WE here collect the URL indexes of the "CMO 2003 Great Mars Report" (from $\lambda=082^\circ\text{Ls}$ to $\lambda=365^\circ\text{Ls}$).

#01	16 Oct 2002 - 15 Nov 2002	(CMO#266)	http://www.kwasan.kyoto-u.ac.jp/~cmo/cmohk/2003repo/01/01.html
#02	16 Nov 2002 - 15 Dec 2002	(CMO#267)	http://www.kwasan.kyoto-u.ac.jp/~cmo/cmohk/2003repo/02/02.html
#03	16 Dec 2002 - 15 Jan 2003	(CMO#268)	http://www.kwasan.kyoto-u.ac.jp/~cmo/cmohk/2003repo/03/03.html
#04	16 Jan 2003 - 15 Feb 2003	(CMO#269)	http://www.kwasan.kyoto-u.ac.jp/~cmo/cmohk/2003repo/04/04.html
#05	16 Feb 2003 - 15 Mar 2003	(CMO#270)	http://www.kwasan.kyoto-u.ac.jp/~cmo/cmohk/2003repo/05/05.html
#06	16 Mar 2003 - 15 Apr 2003	(CMO#271)	http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn3/271OAA/index.htm
#07	16 Apr 2003 - 15 May 2003	(CMO#272)	http://www.kwasan.kyoto-u.ac.jp/~cmo/cmohk/2003repo/07/07.html
#08	16 May 2003 - 15 June 2003	(CMO#273)	http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn3/273OAA/index.htm
#09	16 June 2003 - 30 June 2003	(CMO#274)	http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn3/274OAA/index.htm
#10	1 July 2003 - 15 July 2003	(CMO#275)	http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn3/275OAA/index.htm
#11	16 July 2003 - 31 July 2003	(CMO#276)	http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn3/276OAA/index.htm
#12	1 Aug 2003 - 15 Aug 2003	(CMO#277)	http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn3/277OAA/index.htm
#13	16 Aug 2003 - 31 Aug 2003	(CMO#278)	http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn0/278OAA/index.htm
#14	1 Sept 2003 - 15 Sept 2003	(CMO#279)	http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn0/279OAA/index.htm
#15	16 Sept 2003 - 31 Sept 2003	(CMO#280)	http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn0/280OAA/index.htm
#16	1 Oct 2003 - 15 Oct 2003	(CMO#281)	http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn0/281OAA/index.htm
#17	16 Oct 2003 - 31 Oct 2003	(CMO#282)	http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn2/282OAA/index.htm
#18	1 Nov 2003 - 15 Nov 2003	(CMO#283)	http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn2/283OAA/index.htm
#19	16 Nov 2003 - 30 Nov 2003	(CMO#284)	http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn2/284OAA/index.htm
#20	1 Dec 2003 - 15 Dec 2003	(CMO#285)	http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn2/285OAA/index.htm
#21	16 Dec 2003 - 31 Dec 2003	(CMO#286)	http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn2/286OAA/index.htm
#22	1 Jan 2004 - 15 Jan 2004	(CMO#287)	http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn3/287OAA/index.htm
#23	16 Jan 2004 - 15 Feb 2004	(CMO#288)	http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn3/288OAA/index.htm
#24	16 Feb 2004 - 15 Mar 2004	(CMO#289)	http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn3/289OAA/index.htm

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CMO n°468/ ISMO #94 (25 April 2018)

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



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