

MARS

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OBSERVATIONS

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CMO/ISMO 2016 Mars Report #06

2016 CMO/ISMO Mars Observations Made During the One-Month Period from 16 March ($\lambda=123^\circ\text{Ls}$) to 15 April ($\lambda=138^\circ\text{Ls}$) 2016

♂..... This is a 6th report of the 2016 CMO/ISMO Mars observations. This time we shall deal with the observations made during the one month period from 16 March through 15 April 2016. The angular diameter started from 10" and the period is closed when $\delta=13.9''$. The planet Mars moved forward in the constellation Sco, and its motion has become slower in April because the stationary phase occurred on 17 April. The apparent declination was around 20°S to 21°S . The Martian season proceeded from $\lambda=123^\circ\text{Ls}$ to $\lambda=138^\circ\text{Ls}$. The cloud/mist variations around the Tharsis ridges were interestingly observed. The southern limb was covered largely by the cloud/mist canopy. The white Hellas showed a complicated structure which was stable during the period. The tilt was $\phi=6^\circ\text{N}$ at the end of the period: This was a bottom and the tilt will face again to the north after mid-April. The residual north polar cap was clearly caught by many as a flat bright segment. The phase angle decreased from $\iota=36^\circ$ to $\iota=25^\circ$ during the present period. The evening terminator should be carefully watched before the opposition in May.

♂..... During this period, we received a total of 103 observations from 14 members. We would like here to express our gratitude to all members and would like to expect their further activity during the present apparition.

AKUTSU, Tomio (Ak) Tochigi, JAPAN

2 Sets of RGB + 2 IR Images (22 March; 8 April 2016) 36cm SCT with an ASI 174MM

ASADA, Tadashi (As) Fukuoka, JAPAN

5 R + 5 B Images (30 March; 2 April 2016) PPARC# 60cm Reflector with an ASI120MM

BUDA, Stefan (SBd) Melbourne, AUSTRALIA

2 Sets of RGB Images (20 March; 8 April 2016) 41cm Dall-Kirkham with an ASI120MM

FOSTER, Clyde (CFs) Centurion, SOUTH AFRICA

22 Colour + 23 IR Images (16, 19,~21, 24,~31 March; 2,~4, 8,~15 April 2016)
36cm SCT @f/33 with an ASI224MC

JUSTICE, Mark (MJs) Melbourne, AUSTRALIA

12 Sets of RGB Images (20, 21, 25, 31 March; 2, 3, 8 April 2016) 30cm Spec with a DMK21AU618

KUMAMORI, Teruaki (Km) Sakai, Osaka, JAPAN

2 *LRGB* + 2 *B* Images (11, 15 April 2016) 35cm SCT @ *f/30* with an ASI120MC & ASI178MM

MORALES RIVERA, Efrain (EMr) Aguadilla, PUERTO RICO

7 Sets of *RGB* Images (18, 25 March; 3, 4, 8, 9, 14 April 2016) 31cm SCT with a Flea 3

MORITA, Yukio (Mo) Hatsuka-ichi, Hiroshima, JAPAN

1 Set of *LRGB* Images (15 April 2016) 36cm SCT with a Flea 3

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

3 *Colour* + 3 *B* Images (27 March 2016) (36cm SCT with a SKYnyx 2-0M)

POUPEAU, Jean-Jacques (JPp) Essonne, France

1 *Colour* Image (15 April 2016) 41cm Cassegrain @ *f/20* with an ASI224MC

TRIANA, Charles (CTr) Bogota, COLOMBIA

1 *Colour* Image (25 March 2016) 25cm SCT @ *f/27* with an ASI120MM

VALIMBERTI, Maurice (MVI) Melbourne, AUSTRALIA

28 *Colour* Images (16, 20,~ 22, 25, 30, 31 March; 2, 3, 6, 8 April 2016)
36cm SCT @ *f/28* with an ASI224MC

WESLEY, Anthony (AWs) NSW, AUSTRALIA

7 *Colour* + 1 *IR* Images (16, 19, 22, 23, 27 March; 1, 15 April 2016) (41cm SCT)

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

8 *Colour* Images (21, 28 March; 2, 3, 5, 12*, 14*, 15* April 2016)
15cm & 20cm* SCT with an ASI120MM

Planetary Plasma and Atmosphere Research Center (PPARC) of the Tohoku University, Japan
(Mt. Haleakala of the Maui island, Hawaii)

♂..... We here give a review chronologically of each of the observations received this one month period. The next issue is planned to be published on 10 May 2016 (an extra issue) and the Mars report will treat the observations made during a fortnight period.

16 March 2016 ($\lambda=123^\circ\text{Ls}-124^\circ\text{Ls}$, $\delta=10.0''-10.1''$)

The angular diameter δ of Mars has reached 10'' and it was expected for δ to grow to 13.9'' one month later. We now begin to review first the images made by **Clyde FOSTER (CFs)** who played a leading role through this one month. On 16 March **CFs** took an L-colour image and an IR685 image at $\omega=110^\circ\text{W}$, $\phi=8^\circ\text{N}$. Several white cloud patches are seen on the L-colour image, but the fundamental dark markings look somewhat blurred and hence it is a bit difficult to identification of the positions of the white patches. The *Ascræus* cloud is however easily identified because it is especially bright. The cloud of *Pavonis Mont* is rather small, and *Arsia Mons* is still less cloudy. The cloud of *Olympus Mons* is white evident, but it is not easy to judge it is located at the western flank. *Mare Sirenum* is visible but its configuration is not definite. Each of cloud groups following *Xanthe* is hard to identify the configuration because the guiding *Phœnicis L* and *Tithonius L* are present but they do not work enough as milestones. *Alba Patera* looks whitish.

Maurice VALIMBERTI (MVI) also uses the same type of the colour camera as CFs, and issued three images at $\omega=312^\circ\text{W}$, $\omega=316^\circ\text{W}$, $\omega=322^\circ\text{W}$ whose colour however is quite shallow, and hence the details are not loud. The npc (north polar cap) and the evening *Hellas* do not make a deep impression. The evening mist which covers the northern part of *Syrtris Mj* is also depicted too mild to show the activity of the mist

band. This must have been checked by true B element. The seeing condition does not look worse because Aryn's nails are visible, but S Sabæus is featureless. The third image does not say about the possible whitish disturbance near at Eden which JUSTICE (MJs) detected just on the preceding day.

Anthony WESLEY (AWs) gives a single RGB image at $\omega=337^\circ\text{W}$, but since AWs uses a series of the Astrodon filters, this must be a composite from R, G and B. Hellas is no more than at the terminator, while the npc is quite definite flatly at the bottom. S Meridiani shows a beautiful shape together with Brangæna. S Margaritifer is dark evident and two Neudrus canals are visible. Oxus is also visible more evidently and the "Oxus dark segment" (ODS) is also checked. The northern district of Syrtis Mj is covered by an evening mist and shows a tendency to be connected with the morning homogeneous mist. On the way there is a light area near Eden which corresponds to the case of MJs on the preceding day. The aspect of the northern end of M Acidalium and its east look to keep the characteristics shown by Bill FLANAGAN in the previous period. The south western limb show a white morning cloud.

18 March 2016 ($\lambda=124^\circ\text{Ls}$ - 125°Ls , $\delta=10.3''$ - $10.4''$)

Efrain MORALES (EMr) gave a set of R, G, B images and an RGB composite at $\omega=186^\circ\text{W}$. Due to the modulation of the B image, the RGB image shows lively the distribution of the white clouds and mists. In addition to the thick brilliant cloud of Olympus Mons near the terminator, the cloud inside of Elysium and the morning mist following Elysium are nicely shot. The Ætheria dark patch is evident seen through the mist. The cloud at the SW limb is large.

19 March 2016 ($\lambda=125^\circ\text{Ls}$, $\delta=10.4''$ - $10.5''$)

CFs gave an L-colour and IR images at $\omega=047^\circ\text{W}$, $\varphi=07^\circ\text{N}$. Already $\delta=10.4$, and considerable details are visible at the area of Auroræ S to Tithonius L. Adjacent to the flat npc, Hyperboreus Lacus is quite dark. At the preceding area of Niliacus L, there exists a thick evening mist. A white cloud is seen near Argyre.

AWs gave an excellent RGB image at $\omega=313^\circ\text{W}$ as well as an IR image at $\omega=321^\circ\text{W}$. On the RGB image the description of the non-uniform white mist from the terminator to over the northern district of Syrtis Mj looks very live. This mist band goes to the morning limb side and show a bit a lighter part at Eden. The evening Hellas is moderate. S Sabæus and S Meridiani are nicely depicted. Oxus is well shown down to Ismenius L as well as on the IR image. The ODS is visible. The description of the east of the bottom of M Acidalium is suggestive. The npc gives a good impression.

20 March 2016 ($\lambda=125^\circ\text{Ls}$, $\delta=10.5''$ - $10.6''$)

CFs gave a B enhanced colour image in addition to the usual L-colour and IR685 images at $\omega=069^\circ\text{W}$. The dark marking are not sharp. Just the evening mist is thick and the Ascræus cloud attracts our notice.

MVI took three 244MC colour images at $\omega=280^\circ\text{W}$, 283°W , 289°W . The inside of Hellas is shown stable. Syrtis Mj shows Huygens crater, while the images are shallow in colour and not attractive.

Stefan BUDA (SBd) sent us a set of R, G and B images (by 120 MM with Astrodon filters) as well

as their RGB composite at $\omega=285^\circ\text{W}$: The composite gives a deeper impression in colour. The inside of Hellas is described in a good balance of light and shade. Notable is a faint evening mist which reaches Syrtis Mj and composes a broad mist band to the morning limb in B. The Huygens crater is visible and S Meridiani is nicely checked with Edom near the morning limb (due to R). The npc is shown in a plausible shape (following Olympia?).

Mark JUSTICE (MJs) gave three sets of R, G, and B images and excellent RGB images at $\omega=301^\circ\text{W}$, $\omega=308^\circ\text{W}$ and at $\omega=318^\circ\text{W}$. At $\omega=301^\circ\text{W}$, two nails of Aryn is shown near the morning limb. The Huygens crater is definite and the northern district of Syrtis Mj is nicely detailed and the area looks bluish because of the evening mist due to the fine B image. The white-looking inside of Hellas looks stereoscopic and the western side is most brilliant. At the preceding area of the npc a remnant of Olympia is visible. Oxus rising from Ismenius L runs upward. At $\omega=308^\circ\text{W}$ (seeing a bit deteriorated) the northern district of Syrtis Mj appears more bluish. S Meridiani is more inside the disk. At $\omega=318^\circ\text{W}$, S Margaritifer has come in, and at the opposite side the northern district of Syrtis Mj looks more whitish. Note the specific shape of the white mist over there. The mist floats toward the morning limb, and on the way it passes through the area of Eden. It is interesting to compare the northern part of M Acidalium how it changes on three occasions through the R images. To see the change of the Hellas in B is also interesting. In B, there is seen a white mist at the southern limb.

21 March 2016 ($\lambda=126^\circ\text{Ls}$, $\delta=10.6''\text{--}10.7''$)

CFs gave an L-colour and IR685 images at $\omega=060^\circ\text{W}$. The area of S Margaritifer is very dim without details. The dark elements near Tithonius L appear all together, but each a bit blurred. To the east of M Acidalium, there is seen a thick evening mist. The Ascræus cloud is small but very bright.

Tim WILSON (TWI) gave a small colour image by the use of a 15cm SCT and 120MM. Near the evening terminator Olympus Mons is whitish bright. At the morning side Elysium appears bright. Cerberus, Phlegra, and Propontis I are associated and the Ætheria dark path is visible through the morning mist. The npc area is bright but its form does not make.

MVI obtained three colour images at $\omega=263^\circ\text{W}$, 268°W , 271°W . Some details of the Huygens crater et al are evident, while the width of the colour shade of the images is narrow, so that the mist from the sinking Elysium to the northern district of Syrtis Mj is scarcely reproduced. The inside of Hellas looks interesting, and these may suggest some presence of small mist patches inside Utopia. The fine ghost arc near the morning limb is annoying.

MJs produced a set of R, G, B images and an RGB composite at $\omega=294^\circ\text{W}$. Syrtis Mj is near the CM, but its northern district looks slightly bluish because the district is covered by a mist band which started from the disappeared Elysium and then drew a broad curve to reach Syrtis Mj. This mist flows out to Æria as is evident in the B image. The B (as well as G) nicely shows a southern mist beyond the bright Hellas. The B is quite excellent showing a distribution of mists. The RGB composite well depict the Huygens crater and its environment. Hellas' bright part shows a short projection. A dark fringe is shown adjacent to the npc.

22 March 2016 ($\lambda=126^\circ\text{Ls}$, $\delta=10.7''\text{--}10.8''$)

Tomio AKUTSU (Ak) took a set of R, G, B images to produce an RGB at $\omega=249^\circ\text{W}$ and also an IR image at $\omega=250^\circ\text{W}$. Mr AKUTSU is now staying in Japan and this is the first contribution to us of his Mars observation in this apparition. Made is use of a C14. Camera is denoted ASI 174MM. Since the R image looks sloppy, the RGB composite looks as if without a core, though Syrtis Mj is present. However the whiteness of the Elysium cloud and the tint of the deserts readily remind us of his lasting skill. The IR image shows much more than the R image. For instance, the Ætheria dark patch is more explicit than in R.

MVI gave a series of successive colour images at $\omega=252^\circ\text{W}$, 254°W , 256°W , 260°W , 262°W . It may be interesting to compare the first image at $\omega=252^\circ\text{W}$ with the last image at $\omega=262^\circ\text{W}$ which differs from the first by 10°W (forty minutes). Inside Elysium a U-shaped bright part, though not detailed. The mist which flows outside looks scarcely explicit. The depth beyond the bright Hellas looks visible on the first image. On the last also the deep southern part looks visible. Elysium's U shaped bright part is visible also on the last image.

AWs obtained an RGB image at $\omega=270^\circ\text{W}$. Hellas is whitish bright, and its southern depth is also whitish. The evening cloud sends a mist towards Syrtis Mj. The fringe of the npc is dark and its further southern segment looks a bit lit.

23 March 2016 ($\lambda=126^\circ\text{Ls}\text{--}127^\circ\text{Ls}$, $\delta=10.8''\text{--}10.9''$)

AWs issued a better RGB image at $\omega=273^\circ\text{W}$. Seeing must have improved, and the image is much detailed. The area of Hellas is nicely described, not only this front side, but also the southernmost whitish misty deep area. At the southern part of Syrtis Mj, the Huygens crater is explicitly pinned down together with some others like the Schröter crater. The area around Syrtis Minor is suggestive. It is rather evident a curved distribution of the broad mist band from the sinking Elysium to the northern part of Syrtis Mj. The southern perimeter of the npc is bounded by a darker segment. A remnant of Olympia seems to exist.

24 March 2016 ($\lambda=127^\circ\text{Ls}$, $\delta=10.9''\text{--}11.0''$)

CFs gave an L-colour and an IR685 image at $\omega=034^\circ\text{W}$. The details on the IR image look ordinary, while the L-colour one shows some more dynamic aspect: It caught a cloud patch near Argyre, and the the evening mist preceding M Acidalium is densely evident. S Meridiani is going away to the night hemisphere, but the two nails of Aryn are seen together with Brangæna. The dark markings at the region from the southern Chryse to Auroræ S (further to Tithonius L) are well described. But Juventæ Fons should be described authentically. The two leaves of Nilokeras are definite. The northern end of M Acidalium looks blurred but Hyperboreus L is quite dark. Sharpness of each marking is however not enough.

25 March 2016 ($\lambda=127^\circ\text{Ls}\text{--}128^\circ\text{Ls}$, $\delta=11.0''\text{--}11.1''$)

CFs gave an L-colour and IR 685 images at $\omega=021^\circ\text{W}$. However the quality of the observation is inferior to the one on the preceding day. As far as S Meridiani comes more inside the disk, the mist/cloud patch preceding Niliacus L is more inside, and hence there is a mist/cloud patch at near Eden appears

thick, and this is the only positive and valuable achievement of the present observation.

Charles TRIANA (CTr) from Columbia sent us a colour image by the use of ASI120MM at $\omega=096^\circ\text{W}$. The image is small, and the details around Olympus Mons are not so clear though the area is surely on the morning side. The area of Tharsis Montes is shown, and especially the Ascræus cloud is whitish bright. The preceding cloud group at near Tithonius L appears more thickly whitish brighter. Solis L is dark near the evening terminator. Alba Patera is a bit whitish. There is seen a covering cloud at the southern limb. The area of the npc is also bright.

EMr issued a set of images and RGB at $\omega=098^\circ\text{W}$. The white cloud at the western flank of Olympus Mons is compact, and the preceding Ascræus cloud (as to which refer please to CMO n°215, n°232 as well as to CMO n°408) is also whitish bright. Furthermore the evening side around Tithonius L is thickly covered by the evening white cloud. Ophir looks also beneath the cloud. Pavonis and Arsia Mons are checked as shadowy ridges. The former shows a faint cloud at the western frank. The Alba Patera cloud is not so thick.

MVI gave a couple of colour images at $\omega=227^\circ\text{W}$ and at 233°W . Both captured the income of the white Hellas. They nicely show some details of M Cimmerium. However the colour of the dark markings is monotonous. They also prove how the U-shaped bright area associated with Elysium is composed: the rhs is the lit surface element and the lhs is made of truly the white cloud. We should say this 224MC is weak in reproducing the faint mist starting from Elysium along the equatorial zone and also weak in showing the variety of the colours on Syrtis Mj.

MJs secured a set of R, G, B images to produce a RGB composite at $\omega=252^\circ\text{W}$. These images are valuable because they prove decisively several points. The preceding branch and the following streak of the U shaped bright part inside Elysium show different colours; the former being whitish but the latter streak showing a pinkish tint. The western branch part reflects really the lit surface streak. It is evident due to the work of the B image that some mist element floats out from Elysium towards Syrtis Mj; and really the northern district showing a bluish tinge. Beyond Hellas white area, a faint mist-like matter exists to the east-southern direction around the south polar point. Some details of the dark markings are also checked: The Huygens crater and its environment as well as some other details are visible inside Syrtis Mj. M Tyrrhenum including Syrtis Minor looks interesting. The western tip of M Cimmerium is explicitly shown as well as the connections with Hesperia. The Ætheria dark patch suggests the present trend (similar to the one in the previous apparitions).

26 March 2016 ($\lambda=128^\circ\text{Ls}$, $\delta=11.1''-11.3''$)

CFs obtained a usual set of L-colour and IR685 images at $\omega=008^\circ\text{W}$. The dark markings look duller without sharpness, but unexpectedly Indus is explicit. Note that a mist/cloud patch is visible near Eden.

27 March 2016 ($\lambda=128^\circ\text{Ls}-129^\circ\text{Ls}$, $\delta=11.3''-11.4''$)

CFs took an L-colour and an IR685 image at $\omega=005^\circ\text{W}$. Though these were taken at an angle not so different than the preceding day, we find two Neudrus canals standing to the south of S Meridiani. M Erythræum appears as a broad dark band. The mist patch near at Eden looks weaker than the one on the

preceding day. The mist near the southern polar mist is irregular. M Acidalium is almost misty, but clearly definite on the IR image. Its northernmost area reminds us of the image made by Bill FLANAGAN in the last period.

Damian PEACH (DPc) is now on the stage. He provided us three sets of RGB and B images at $\omega=053^\circ\text{W}$, $\omega=059^\circ\text{W}$, $\omega=064^\circ\text{W}$. Except for the southern dusky areas, the usual markings are thoroughly described if not to say the most superb. Juventæ Fons is spotted most smartly than that in other images. The descriptions of the mists over the surface are excellent especially in the latter two: At $\omega=064^\circ\text{W}$, the details of the mists at the evening Xanthe to the inside Ophir-Candor, and further the mist following Nilokeras should be apotheoses when we analyse other coming images. The three shots all show the Ascræus cloud streak brilliantly. Arsia Mons looks still free from the mist but we should note a presence of a morning mist patch to the south of Arsia. To a bit east of Ascræus cloud, there exists a roundish white patch with a shadowy spot inside. This has been long known since the 1990's but not so focused. We will therefore make a Note about it as the Fortuna double ring if we finish the present apparition. The evening Acidalium does not show its darker aspect because of the evening mist, but the northernmost part shows up together with the dark Hyperboreus L. The variation of the evening mist is interesting: the first image may show a thick patch which may be related with the Eden one. The mist/cloud at the southern limb is to be also well chased.

AWs's RGB shot at $\omega=240^\circ\text{W}$ looks nearly perfect. The inside of Elysium is detailed where the small white spot on the left branch must be Elysium Mons. The evening mist thinly covers of the Elysium area. The southern limb white haze is shown separated from the white deposit of Hellas. The area of Syrtis Minor is detailed, and M Cimmerium shows up clearly the Herschel crater and the leg with the Gale crater. To the flat npc, a dark band is adjacent, and Olympia looks to precedes the npc.

28 March 2016 ($\lambda=129^\circ\text{Ls}$, $\delta=11.4''-11.5''$)

CFs obtained a set of an L-colour and IR685 images at $\omega=002^\circ\text{W}$: These are not perfect, but these suggest that the colour image must have been an excellent and effective piece of image if accompanied by the sharper true R, G and B. If the original R image emphasises the contrast a bit more, the RGB composite might have been more amazing. Compare the aspect of the details at the southern end of Chryse with the decomposed R. That is, the colour camera image is inferior to the single R image in producing the details. Most notable is the bright mist near Eden which is connected with the evening mist. This singular mist patch was of the same kind as the one recorded by MJs on 15 March 2016 ($\lambda=123^\circ\text{Ls}$). This time it was possible for the patch to be caught in R and G in addition in B.

TWI's colour image by the use of a 15cm SCT at $\omega=107^\circ\text{W}$ is too small to be analysed, while a evening cloud patch at Tharsis is evident.

29 March 2016 ($\lambda=129^\circ\text{Ls}-130^\circ\text{Ls}$, $\delta=11.5''-11.6''$)

CFs successively made an L-colour and an IR685 image at $\omega=345^\circ\text{W}$, $\phi=6^\circ\text{N}$. These images are good in general, but look short of sharpness. Note that the Oxus dark segment (ODS) is evident, also in IR. The light patch near Eden looks weak in whiteness (is it now expressing a lit surface?). How about another B image?

30 March 2016 ($\lambda=130^\circ\text{Ls}$, $\delta=11.6''-11.7''$)

CFs gave a set of L-colour and IR685 images at $\omega=330^\circ\text{W}$. The area around S Meridiani shows a detail up to the standard, but the markings look sleepy in general. Evening mist is seen floating over the northern district of Syrtis Mj. No possible mention about the Eden mist.

Tadashi ASADA (As) manipulated by remote control from his home in Japan a 60cm telescope which is located on the summit of Mt Haleakala on the Maui island, Hawaii, and obtained Martian images at $\omega=152^\circ\text{W}$ (14h45GMT), $\omega=160^\circ\text{W}$, $\omega=170^\circ\text{W}$ (16h00GMT). He sent us partly the sets of (R, B) images. The R images tell a slight peculiarity of the western side of M Sirenum. The third R image shows the leg with the Gale crater in M Cimmerium quite near the morning limb. Some details of Phlegra are shown. The highlight of the B image at $\omega=152^\circ\text{W}$ is the description of the white clouds associated with Olympus Mons and Tharsis Montes. The cloud of Olympus Mons look divided to two. This was also observed in 2014, but we will survey later the phenomenon topographically (perhaps they are the so-called *roll clouds*). Since the idea of the so-called W cloud was introduced by E C SLIPHER in 1954, and hence it is expected for every observer to collect much more information through the true B images at this region (needless to say, the apparition in 1954 is similar to the present apparition).

As's remote-control observations make use of the facilities of the Tohoku University on Haleakala (see the Report in CMO n°432): The telescope is equipped with an ASI 120 MM together with the filter wheel, and the dome and the slit are controlled to catch the planet. If it rains, the dome does not open or when it is opened, it shall be automatically made closed if the humidity becomes high. There is a time difference between Maui and ASADA's home, and so this difference may work well in a critical phase. As to the system ASADA will write something in the CMO in a near future.

MVI obtained two colour images at $\omega=162^\circ\text{W}$, 176°W . Observational times are 15h29GMT, 16h24GMT so that the time zone crosses with Hawaii. On MVI's images, the markings look faded, and less contrasty. However, the Gale crater is spotted at M Cimmerium, and the division of the Olympus Mons cloud.

31 March 2016 ($\lambda=130^\circ\text{Ls}-131^\circ\text{Ls}$, $\delta=11.7''-11.9''$)

CFs gave a set of L-colour and IR685 images at $\omega=332^\circ\text{W}$ similar to those on the preceding day. There looks to be found no major change. The ODS is visible on the IR685 image.

MVI obtained also similar two sets of the colour images at $\omega=174^\circ\text{W}$, 178°W . There follow still two clouds at the western flank of Olympus Mons: These might be the so-called orographic *roll clouds*. M Cimmerium is fully visible with minor details, but the markings lack the darkness and colourfulness.

MJs produced two sets of R, G, B images and two RGB composites at $\omega=199^\circ\text{W}$, 206°W . The cloud at Olympus Mons is on the terminator. Elysium is near the CM and the cloud branch at the left-hand side is white including Elysium Mons, and the rhs looks to show a pinkish tint implying a dusty or a barely lit surface streak. These pictures explicitly show a misty band from the evening terminator to the south of Elysium and further suggest its floating to the morning limb. The description of M Cimmerium has become quite detailed. The southern canopy is whitish large and shows an irregularity.

1 April 2016 ($\lambda=131^\circ\text{Ls}$, $\delta=11.9''-12.0''$)

AWs's RGB image at $\omega=195^\circ\text{W}$ is excellent. The cloud at Olympus Mons is near the evening terminator. The inside of Elysium beautifully described with the explicit *Ætheria* dark patch. The area around the Herschel crater is perfectly mapped. To the south of the flat npc, Olympia is nicely separated.

2 April 2016 ($\lambda=131^\circ\text{Ls}-132^\circ\text{Ls}$, $\delta=12.0''-12.1''$)

CFs took an L-colour and an IR685 image at $\omega=303^\circ\text{W}$. From the terminator, a misty band floats out to *Æria*, passing through the northern part of Syrtis Mj. It is suggested that the inside of Hellas still remains its morning form.

TWI gave an IR image at $\omega=055^\circ\text{W}$. The areas of Solis L and M Acidalium are dark, though no detail is shown.

As produced two sets of (R, B) images at $\omega=123^\circ\text{W}$, 133°W by remote control. The cloud at Olympus Mons is very bright, but the second roll is much weaker. The *Ascræus* cloud looks large on B. The cloud at Pavonis Mons is visible but as to *Arsia* Mons the flank cloud is much weaker. These B images are precious at this season. On R, M Sirenum is visible with *Caralis Fons*.

MJs obtained one set of element images to produce the RGB composite at $\omega=167^\circ\text{W}$. The whitish bright cloud at the western flank of Olympus Mons beautifully and impressively flows down towards the NW direction. Tharsis ridges with the white coverings reached the terminator. The morning Elysium is completely inside the disk: *Phlegra* is detailed and the shape of *Propontis I* is miraculously depicted.

MVI gave three colour images at $\omega=171^\circ\text{W}$, 174°W , 176°W . Hellas is coming in. It is good to see the summit of Olympus Mons as a dark spot.

3 April 2016 ($\lambda=132^\circ\text{Ls}$, $\delta=12.1''-12.3''$)

CFs obtained a set of L-colour and IR685 images at $\omega=309^\circ\text{W}$. The sharpness of every marking is not enough, while the invasion of the evening mist to the lower part of Syrtis Mj is well visible. Notable is that the following area of *Boreosyrtis* looks lighter.

EMr obtained a set of R, G, B images to produce a RGB composite at $\omega=015^\circ\text{W}$. It is noted that the mist patch near *Eden* is explicitly visible. It is clearly seen in G and B. On the southern hemisphere the band of M *Erythræum* is dark and broad. *Argyre* is captured and to the south of it there is a southern mist patch. Near the npc *Hyperboreus L* is a bit seen.

TWI gave an LRGB colour image at $\omega=053^\circ\text{W}$. M Acidalium is largely present, and the preceding evening mist is also visible. The area around Solis L is a dark area. A presence of mist/cloud is felt at the southern limb. Much better than the preceding IR image.

MVI lined up bit by bit four colour images at $\omega=132^\circ\text{W}$, 135°W , 137°W , 141°W . They chased the area around Olympus Mons near the CM, while it will be more meaningful to concentrate on the area of Tharsis Montes. It is not easy to reveal the shape of M Sirenum, but to the south of M Sirenum, *Caralis Fons* looks to appear.

MJs gave two sets at $\omega=157^\circ\text{W}$, 172°W . The tail of the cloud at the west flank of Olympus Mons looks still longer. The Tharsis evening cloud is just near the terminator. R may suggest the presence of Caralis Fons to the south of M Sirenum.

4 April 2016 ($\lambda=132^\circ\text{Ls}-133^\circ\text{Ls}$, $\delta=12.3''-12.4''$)

CFs obtained a set of L-colour and IR685 images at $\omega=297^\circ\text{W}$. The sharpness is duller and is not still improved. Hellas is near the terminator, but the inside is totally visible.

EMr gave a set of images and an RGB composite at $\omega=348^\circ\text{W}$. The evening terminator mist patch is dense to the north of sinking Syrtis Mj and the mist flows toward Eden. The morning mist from Niliacus L to Chryse is beautiful. The mist at the southern limb is thickly visible.

5 April 2016 ($\lambda=133^\circ\text{Ls}$, $\delta=12.4''-12.5''$)

CFs gave a set of L-colour and IR685 images at $\omega=296^\circ\text{W}$. Very similar result is shown to the one on the preceding day. The evening mist is vastly visible, especially at Libya.

TWI gave an IR-RGB image at $\omega=027^\circ\text{W}$. This is a bit superior to his preceding one. S Margaritifer is visible and the sinking S Meridiani is outstanding separated. A cloud stays at the southern limb.

6 April 2016 ($\lambda=133^\circ\text{Ls}-134^\circ\text{Ls}$, $\delta=12.5''-12.7''$)

MVI lined up four colour images at $\omega=097^\circ\text{W}$, 101°W , 107°W , 109°W . Solis L is inside the range, but it is never impressive. The cloud distribution from the terminator to the Tharsis ridges is tedious to trace. It will need a time to discriminate what are more important and what are less.

8 April 2016 ($\lambda=134^\circ\text{Ls}-135^\circ\text{Ls}$, $\delta=12.8''-12.9''$)

CFs took an L-colour and an IR685 image at $\omega=260^\circ\text{W}$. Elysium is near the evening terminator. The cloud inside is thick and it explicitly flows out southwards. It is hoped that the further distribution of the mist/cloud to the Syrtis Mj area is more explicitly reproduced. Hellas is very miraculous, though *déjà-vu*.

EMr gave a set of R, G, B images to compose an RGB image at $\omega=316^\circ\text{W}$. The northern district of Syrtis Mj in the evening is covered by the white mist as shown in B, and proves to show as if the district has a bluish tint in the RGB image. In B, to the east of the northern part of M Acidalium there seems to show a mist band. The npc is still well visible.

Ak obtained a set of R, G, B images and composed an RGB image at $\omega=077^\circ\text{W}$. He also obtained an IR image at $\omega=079^\circ\text{W}$. Solis L is located at the SE corner of the disk but without explicit contour. IR however Tithonius L is spotted. The cloud canopy at the southern limb is large with a blue-whitish tint. At the northern evening corner, M Acidalium with Nilokeras is darkly seen. More definite it is on the IR image. Tempe is a bit light (both in R and B). The evening mist which is originated from Chryse is thick.

MVI lined up six colour images at $\omega=078^\circ\text{W}$, 082°W , 085°W , 091°W , 094°W , 097°W . The evening clouds are shown in low contrast. The area of the big M Acidalium is still inside the disk but looks fainter and not definitely depicted. Juventæ Fons is among the mist or cloud. The southern limb cloud/mist is interestingly quite layered. MVI regards the morning peripheral outside of the npc as disturbed by dust.

Sbd obtained a set of R, G, B images and made an RGB composite at $\omega=089^\circ\text{W}$. This is taken in a good angle. Some details of Agathodæmon and Tithonius L are nicely shown in R, and so the RGB image well proves the covering mist at Ophir-Candor and at around the "Fortuna double ring". Juventæ Fons is seen through. The entanglement of the thick mist streak with Nilokeras is interesting. The streak comes from Chryse downwards NW direction. The large complex cloud canopy at the southern limb is quite a spectacle. SBs's RGB may confirm MVI's arctic dust.

MJs produced two sets of images and composed two RGB images at $\omega=105^\circ\text{W}$, 115°W : The interval by 10°W is idealistic. In R, M Acidalium is still inside the disk, and in RGB, it appears covered by some evening mist distributions. The various mist patches seen from the evening terminator to the west flank of Olympus Mons are nicely depicted. The so-called "Fortuna double ring" is whitish visible preceding the Ascræus cloud which is still large and whitish bright. The mist/cloud irregular canopy looks real. The mist streak which runs at the west side of Niliacus L is interesting. MVI's dust near the npc looks visible.

9 April 2016 (135°Ls , $\delta=12.9''-13.1''$)

CFs gave a set of L-colour + IR685 images at $\omega=245^\circ\text{W}$. Syrtis Mj now stays on the morning side. Hellas is conspicuous from the morning limb. M Cimmerium looks natural with some details. Syrtis Minor is suggestive. Notable is the mist band from Elysium to Syrtis Mj.

EMr took a set of images and composed an RGB image at $\omega=323^\circ\text{W}$. Since the original R element is not so detailed, the RGB is not the best, but the distribution of the mist is beautiful in good contrast with the orangish surface. The evening mist at the northern part of Syrtis Mj flows out to Æria and continues to the morning mist. The area around Eden is not particularly misty. Note a presence of a mist patch near Boreosyrtis. Hellas looks duller near the evening side.

10 April 2016 ($\lambda=135^\circ\text{Ls}-136^\circ\text{Ls}$, $\delta=13.1''-13.2''$)

CFs only issued an IR685 image at $\omega=234^\circ\text{W}$. The angular diameter reached $13''$, while the details are lacking concerning the Ætheria dark patch and M Cimmerium.

11 April 2016 ($\lambda=136^\circ\text{Ls}$, $\delta=13.2''-13.3''$)

CFs took an L-colour and an IR685 image at $\omega=228^\circ\text{W}$. The colour image looks adequate since M Cimmerium (around at the Herschel crater) and the Ætheria dark patch are detailed. The contrast of the morning Hellas and the southern limb mist is pretty. Note that Olympia is visible preceding the npc. The morning mist over the coming Syrtis Mj might be a bit stronger.

Teruaki KUMAMORI (Km) is now on stage with a new employment of C14. The LRGB image by ASI 224MC is at $\omega=074^\circ\text{W}$ and B by ASI 178MM at $\omega=077^\circ\text{W}$. The description of the area around Tithonius L and Solis L is one of the best among the images we received hitherto in this apparition. Ophir is covered by three layers of mists. The core of Juventæ Fons is apparent, and Fortuna double ring is softly depicted. The cloud stream from Xanthe to Nilokeras looks interesting: The tangle of the twin nails of Nilokeras with the evening mist/cloud will be treated after the season ended. The B image is terribly poor.

12 April 2016 ($\lambda=136^\circ\text{Ls}-137^\circ\text{Ls}$, $\delta=13.3''-13.5''$)

CFs took a usual set at $\omega=219^\circ\text{W}$. The L-colour is inferior to the work on the preceding day. Just Syrtis Mj is near the limb, and hence it looks weakly bluish.

TWI changed the instrument to a 20cm SCT and obtained an IR-RGB image at $\omega=316^\circ\text{W}$. The present

image is several steps better than his images so far. Oxus is visible, and the bottom of M Acidalium has just come in. The evening mist crossing Syrtis Mj is suggested. S Sabæus/S Meridiani is attractive.

13 April 2016 ($\lambda=137^\circ\text{Ls}$, $\delta=13.5''\sim 13.6''$)

CFs took a usual set of an L-colour + an IR685 images at $\omega=212^\circ\text{W}$: The choice of this angle is cleverer since at this angle Syrtis Mj begins to show up its slim faint-bluish presence from the morning limb. The details of the L-colour are not the best, but the very details are given on the IR785 image.

14 April 2016 ($\lambda=137^\circ\text{Ls}\sim 138^\circ\text{Ls}$, $\delta=13.6''\sim 13.8''$)

CFs took an L-colour and an IR685 image at $\omega=204^\circ\text{W}$. The L-colour image is preferable. M Cimnerium and Elysium are near the CM, and a remainder of the Olympus Mons cloud is faintly seen at the evening terminator.

EMr obtained a set of images to compose an RGB image at $\omega=267^\circ\text{W}$. The cloudy Elysium (bounded by a pinkish line) is quite near the terminator and the area sends a faintly misty band to Syrtis Mj. Syrtis Mj is detailed. The Hesperia shows a small light area. The lhs coast of Syrtis Mj also shows several light patches. Hellas is covered by a large mist.

TWI made one colour composite at $\omega=296^\circ\text{W}$. Similar to his previous image, this shows that Syrtis Mj more inside and S Meridiani just came in.

15 April 2016 ($\lambda=138^\circ\text{Ls}$, $\delta=13.8''\sim 13.9''$)

J-J POUPEAU (J²Pp) obtained a 224MC image at $\omega=184^\circ\text{W}$. The colour in general looks dull. Elysium cannot be said to have described in good contrast.

CFs took a usual set of L-colour + IR685 images at $\omega=193^\circ\text{W}$. The dark markings are detailed on the IR685 image showing a clear Propontis I + Phlegra, while the colour image is duller. The mist at the southern limb is large.

TWI secured an IR-RGB image at $\omega=285^\circ\text{W}$: This is the best among the images TWI obtained hitherto. A minor dot called Nodus Alcyonius is visible. The shape of Syrtis Major is well mapped. S Meridiani has come in.

Yukio MORITA (Mo) was absent for a while because he was busy, but made a good set of R, G, B, L images and composed an RGB and an LRGB images. The angle is at $\omega=049^\circ\text{W}$. The surface is full of mists. Just to the north of M Erythræum a stretch of a broad mist band lies and according to the B image the band goes further down passing the bright Ophir-Candor to the morning side. Argyre is also misty (related with the southern limb haze) and there is a mist patch at the north of Solis L. Of course the evening mists preceding Niliacus L are conspicuous and go up to Chryse. Note that there runs a mist streak to the north of Lunæ L towards a SW-NE direction (originally visible in B). Among the misty M Acidalium, the part of Tanais looks rather free from the mist covering. We believe the R image is most fundamental, and the present one is of high quality. S Meridiani is visible near the terminator, and Oxia Palus is evident beneath a weak evening mist.

AWs gave an RGB image at $\omega=052^\circ\text{W}$: This also describes the surface which is full of mists. To the east of Agathodæmon a broad mist band runs down to Candor. Misty S Meridiani is a bit visible. The

upper half of M Acidalium looks slightly faded while the opposite northern part shows us a darker area. The area of Nilokeras looks interesting because of the entanglement of the naked markings and the thicker mists. The npc is nicely shot, flat about definite. The southern limb mist shows us a whitish blue tint.

Km gave an excellent LRGB image at $\omega=059^\circ\text{W}$ and a B image at $\omega=062^\circ\text{W}$. This is made of the images from 224MC and 178MM (L). The highlight is the clear depiction of the area around Agathodæmon and Tithonius L. The lower edge of Solis L is detailed. The southern end of Chryse is also detailed. The description of the lower half of M Acidalium is good. Iaxartes is visible as well as Hyperboreus L. Apparently the southern canopy is irregular. The B image is still poor.

Masatsugu MINAMI and Masami MURAKAMI

Forthcoming 2016 Mars (#08)

Ephemeris for the Observations of the 2016 Mars. IV

May & June 2016

By

Masami MURAKAMI

As a sequel to the preceding list (in CMO n°444) 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 2016 to 30 June 2016: 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 Lon-

gitude of the Sun, the Apparent 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 2016*.

Date (00:00GMT)	ω	ϕ	λ	δ	ι	Π	D
01 May 2016	003.82°W	07.00°N	145.52°Ls	16.10"	17.0°	35.2°	-21°42'
02 May 2016	354.87°W	07.13°N	146.02°Ls	16.24"	16.3°	35.3°	-21°42'
03 May 2016	345.92°W	07.25°N	146.53°Ls	16.38"	15.6°	35.3°	-21°43'
04 May 2016	336.98°W	07.37°N	147.03°Ls	16.52"	14.9°	35.4°	-21°44'
05 May 2016	328.05°W	07.51°N	147.54°Ls	16.65"	14.2°	35.5°	-21°44'
06 May 2016	319.14°W	07.66°N	148.05°Ls	16.78"	13.5°	35.5°	-21°45'
07 May 2016	310.23°W	07.80°N	148.56°Ls	16.91"	12.7°	35.6°	-21°46'
08 May 2016	301.33°W	07.94°N	149.07°Ls	17.04"	12.0°	35.7°	-21°46'
09 May 2016	292.45°W	08.11°N	149.58°Ls	17.16"	11.2°	35.7°	-21°46'
10 May 2016	283.57°W	08.27°N	150.10°Ls	17.28"	10.4°	35.8°	-21°46'
11 May 2016	274.70°W	08.44°N	150.61°Ls	17.39"	09.6°	35.9°	-21°46'
12 May 2016	265.83°W	08.60°N	151.12°Ls	17.51"	08.8°	36.0°	-21°46'
13 May 2016	256.98°W	08.78°N	151.64°Ls	17.61"	08.0°	36.1°	-21°46'
14 May 2016	248.13°W	08.96°N	152.15°Ls	17.71"	07.2°	36.2°	-21°46'
15 May 2016	239.29°W	09.14°N	152.67°Ls	17.81"	06.4°	36.2°	-21°45'
16 May 2016	230.46°W	09.32°N	153.18°Ls	17.91"	05.6°	36.3°	-21°45'
17 May 2016	221.63°W	09.51°N	153.70°Ls	17.99"	04.8°	36.4°	-21°44'

Date (00:00GMT)	ω	ϕ	λ	δ	ι	Π	D
18 May 2016	212.80°W	09.71°N	154.22°Ls	18.07"	04.0°	36.5°	-21°43'
19 May 2016	203.98°W	09.90°N	154.74°Ls	18.15"	03.1°	36.6°	-21°43'
20 May 2016	195.17°W	10.09°N	155.26°Ls	18.23"	02.3°	36.7°	-21°42'
21 May 2016	186.36°W	10.29°N	155.78°Ls	18.29"	01.5°	36.8°	-21°41'
22 May 2016	177.55°W	10.49°N	156.31°Ls	18.35"	00.9°	36.8°	-21°40'
23 May 2016	168.74°W	10.68°N	156.83°Ls	18.40"	00.9°	36.9°	-21°38'
24 May 2016	159.93°W	10.88°N	157.35°Ls	18.46"	01.6°	37.0°	-21°37'
25 May 2016	151.13°W	11.08°N	157.88°Ls	18.50"	02.4°	37.1°	-21°36'
26 May 2016	142.33°W	11.27°N	158.40°Ls	18.53"	03.2°	37.2°	-21°34'
27 May 2016	133.52°W	11.47°N	158.93°Ls	18.56"	04.1°	37.3°	-21°33'
28 May 2016	124.72°W	11.66°N	159.45°Ls	18.58"	04.9°	37.3°	-21°31'
29 May 2016	115.91°W	11.85°N	159.98°Ls	18.60"	05.8°	37.4°	-21°30'
30 May 2016	107.10°W	12.04°N	160.51°Ls	18.61"	06.7°	37.5°	-21°28'
31 May 2016	098.29°W	12.23°N	161.04°Ls	18.61"	07.5°	37.6°	-21°26'
01 June 2016	089.47°W	12.42°N	161.57°Ls	18.61"	08.4°	37.6°	-21°25'
02 June 2016	080.65°W	12.60°N	162.11°Ls	18.60"	09.3°	37.7°	-21°23'
03 June 2016	071.83°W	12.78°N	162.64°Ls	18.58"	10.1°	37.8°	-21°21'
04 June 2016	063.00°W	12.95°N	163.18°Ls	18.56"	11.0°	37.8°	-21°20'
05 June 2016	054.16°W	13.13°N	163.71°Ls	18.53"	11.8°	37.9°	-21°18'
06 June 2016	045.32°W	13.29°N	164.25°Ls	18.49"	12.6°	37.9°	-21°16'
07 June 2016	036.46°W	13.45°N	164.79°Ls	18.45"	13.5°	38.0°	-21°24'
08 June 2016	027.60°W	13.61°N	165.32°Ls	18.41"	14.3°	38.1°	-21°13'
09 June 2016	018.74°W	13.77°N	165.86°Ls	18.36"	15.1°	38.1°	-21°11'
10 June 2016	009.87°W	13.91°N	166.40°Ls	18.30"	15.9°	38.2°	-21°10'
11 June 2016	000.99°W	14.05°N	166.94°Ls	18.24"	16.7°	38.2°	-21°08'
12 June 2016	352.08°W	14.19°N	167.48°Ls	18.17"	17.5°	38.2°	-21°07'
13 June 2016	343.16°W	14.33°N	168.02°Ls	18.11"	18.3°	38.3°	-21°06'
14 June 2016	334.25°W	14.45°N	168.57°Ls	18.03"	19.1°	38.3°	-21°04'
15 June 2016	325.32°W	14.56°N	169.11°Ls	17.95"	19.8°	38.4°	-21°03'
16 June 2016	316.37°W	14.68°N	169.66°Ls	17.87"	20.6°	38.4°	-21°02'
17 June 2016	307.42°W	14.79°N	170.20°Ls	17.79"	21.3°	38.4°	-21°01'
18 June 2016	298.45°W	14.88°N	170.75°Ls	17.70"	22.0°	38.5°	-21°01'
19 June 2016	289.48°W	14.97°N	171.30°Ls	17.61"	22.7°	38.5°	-21°00'
20 June 2016	280.49°W	15.05°N	171.84°Ls	17.51"	23.4°	38.5°	-21°00'
21 June 2016	271.48°W	15.14°N	172.39°Ls	17.42"	24.1°	38.5°	-20°59'
22 June 2016	262.47°W	15.21°N	172.94°Ls	17.32"	24.7°	38.6°	-20°59'
23 June 2016	253.44°W	15.27°N	173.50°Ls	17.22"	25.4°	38.6°	-20°59'
24 June 2016	244.40°W	15.34°N	174.05°Ls	17.11"	26.0°	38.6°	-20°59'
25 June 2016	235.35°W	15.40°N	174.60°Ls	17.01"	26.6°	38.6°	-20°59'
26 June 2016	226.28°W	15.44°N	175.16°Ls	16.90"	27.2°	38.6°	-21°00'
27 June 2016	217.20°W	15.48°N	175.72°Ls	16.79"	27.8°	38.6°	-21°00'
28 June 2016	208.11°W	15.51°N	176.27°Ls	16.68"	28.4°	38.6°	-21°01'
29 June 2016	199.01°W	15.55°N	176.83°Ls	16.57"	29.0°	38.6°	-21°02'
30 June 2016	189.89°W	15.56°N	177.39°Ls	16.46"	29.6°	38.6°	-21°03'
01 July 2016	180.71°W	15.57°N	177.95°Ls	16.34"	30.1°	38.6°	-21°04'

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Letters to the Editor

●.....*Subject: Mars 2016/03/16 0258UT*
Received: 17 March 2016 at 04:59 JST

Hi All, A Mars capture from this morning under less than ideal conditions. Probably a bit overprocessed, although I was trying to bring out the clouds. Other than the "normal" equatorial and Tharsis clouds, cloud is also seen over the Tempe Terra region. Possibly a small cloud near the NPC and what appears to be fairly extensive cloud across the southern limb.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160316/CFs16Mar16.jpg>

○.....*Subject: Mars 2016/03/19 0034UT*
Received: 19 March 2016 at 12:05 JST

Hi All, Mars capture from this morning. Bright cloud over Eden, with some more subtle equatorial cloud. Argyre with cloud/frost is evident in the south east and also some subtle markings over Mare Erythraeum.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160319/CFs19Mar16.jpg>

○.....*Subject: Mars 2016/03/20 0242UT*
Received: 20 March 2016 at 16:38 JST

Hi All, Mars capture from this morning. Unfortunately a very short session with high cloud and heavy dewing due to cooler conditions after heavy rain this last week. So conditions rather poor, but submitting "for the record". However a few comments:

1) Particularly in the IR image, there appears to be a fine line joining the Valles Marineris region with Nilokeras. Under these poor conditions, however, it is difficult to make a firm assessment.

2) More out of interest, in processing, I "pushed" the blue channel a little and it produced an interesting effect. Namely that it gives the impression of extensive haze across a large portion of the planet (attached portrait image). However, again under these conditions, I would be wary of drawing any significant conclusions.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160320/CFs20Mar16.jpg>

○.....*Subject: Mars 2016/03/21 0244UT*
Received: 21 March 2016 at 13:28 JST

Hi all, Mars capture from this morning.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160321/CFs21Mar16.jpg>

○.....*Subject: Mars 2016/03/24 0251UT*
Received: 24 March 2016 at 21:25 JST

Hi all, Quite a night. Out at about 21.00 yesterday evening trying to get a better grip on my collimation. Then out of bed at about 01.30 to capture the Jupiter double transit. Back in bed and up again at 4.30 for my Mars capture. Exceptionally heavy dew, and water literally dripping off the scope. Then needed to go into the office this morning as well. I was about to say "I love my job"(imaging), but its not my job.....Maybe one of these days....!

Plenty of cloud on the Mars image of this morning:

- 1) The cloud that has been noticeable in a few of my recent images over the Eden/Oxia region, is showing quite distinctly
- 2) Looks like more cloud near the NPC
- 3) Bright cloud over Tharsis (on the limb) and appears to extend into Solis Lacus
- 4) Cloud in/over Argyre I, with general southern limb cloud.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160324/CFs24Mar16.jpg>

○.....*Subject: Mars 2016/03/25 0237UT*
Received: 25 March 2016 at 19:28 JST

Hi all, Seeing conditions not particularly good this morning. Similar cloud structures, and "frosty Argyre" (I have been told :-) as yesterday. Best regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160325/CFs25Mar16.jpg>

○.....*Subject: Mars 2016/03/26 0223UT*
Received: 26 March 2016 at 13:09 JST

Hi all, Image set from this morning.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160326/CFs26Mar16.jpg>

○.....*Subject: RE: Mars 2016/03/27 0248UT*
Received: 28 March 2016 at 00:16 JST

Hi all, Image set from this morning. The cloud over Eden/Oxia is less obvious today. Image is a bit "soft", but also trying hard not to over process as well.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160327/CFs27Mar16.jpg>

○.....*Subject: 2nd anniversary 28 March 2016*
Received: 28 March 2016 at 04:31 JST

Hi all, A bit of an "anniversary" for me tomorrow. Two years ago I installed the 14" in my observatory. It replaced my 12" LX200, and also coincided with an upgraded motorised rolloff roof structure. This triggered my serious interest in astro-imaging, and more

specifically my interest in Mars imaging. I believe my first contact with Richard at the BAA was sometime in May 2014. Shortly after that I started interacting with Roger and Jim at ALPO, and in September 2014 I discovered the CMO and started submitting images, and also interacting with Reiichi Konnai, who has made a number of interesting commentaries on my images. In between I have had input from Christophe and Marc to help me along the way which has been very much appreciated. Its been quite a journey already, but hopefully just the start of a much longer journey. It is my wish that at some stage I will have the opportunity of meeting you all personally. I have sent through a few images before, but I attach a few of the observatory to celebrate the anniversary. Best regards,



○...*Subject: Mars 2016/03/28 0316UT*
Received: 28 March 2016 at 15:38 JST

Hi all, Image set from this morning. Inverted V-shaped cloud over Eden. Although clear conditions, seeing is average at best. Best regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160328/CFs28Mar16.jpg>

○...*Subject: Mars 2016/03/29 0244UT*
Received: 29 March 2016 at 13:38 JST

Hi all, Image set from this morning. Although clear conditions, seeing was poor. The inverted V-shaped cloud over Eden looks like it has dissipated a bit. I

note the rather large reddish area in the approximate region of Noachis. It is so distinct that I thought it may be a mark on my camera chip. However, checking yesterdays image and also comparing images taken over a few minutes, it is definitely rotating with the planet. I also note what looks like a very condensed bright spot at the NPC, particularly on the B image. Light cloud over Aeria, looking like it extends over Syrtis Major which is just on the evening terminator.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160329/CFs29Mar16.jpg>

○...*Subject: Mars 2016/03/30, 2016/03/31*
Received: 1 April 2016 at 04:39 JST

Hi all, Images from 30 and 31 March. Unfortunately seeing conditions were very poor, but submitting for the record. Cloud is noticeable over Syrtis Major.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160330/CFs30Mar16.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160331/CFs31Mar16.jpg>

○...*Subject: Mars 2016/04/2 0223UT*
Received: 2 April 2016 at 17:10 JST

Hi all, Image set from this morning. Seeing conditions remain poor, and the capture was taken through high cloud. Possibly a small disturbance in the northern Arabia region, which shows slightly lighter. I am keen to get back onto RGB's, but am delaying for two reasons: a) I am trying to manage my time as I still have to go to work at 7 in the morning and b) with the seeing conditions as poor as they have been recently, I think I am going to struggle getting reasonable results. However, hopefully conditions will still improve as we move towards winter and the opposition and I will change to RGB's as soon as possible.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160402/CFs02Apr16.jpg>

○...*Subject: Mars 2016/04/3 0327UT*
Received: 4 April 2016 at 00:03 JST

Hi all, Image set from this morning. The brightish "disturbance" in the northern Arabia region which I noted yesterday is still evident. Best regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160403/CFs03Apr16.jpg>

○...*Subject: Mars 2016/04/4 0313UT*
Received: 4 April 2016 at 13:38 JST

Hi all, Image set from this morning. The brightish "disturbance" in the northern Arabia region looks it has dissipated somewhat. Interesting line running

across Hellas. I also note small bright spot south of Hellas.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160404/CFs04Apr16.jpg>

○…*Subject: Mars 2016/04/5 0349UT*
Received: 6 April 2016 at 03:14 JST

Hi all, Image set from this morning. The marking in Hellas seems to have a reddish tint. Dust deposits?

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160405/CFs05Apr16.jpg>

○…*Subject: Mars 2016/04/8 0316UT*
Received: 9 April 2016 at 03:41 JST

Hi all, Image set from this morning. Best regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160408/CFs08Apr16.jpg>

○…*Subject: Mars 2016/04/9 0249UT*
Received: 9 April 2016 at 23:28 JST

Hi all, Image set from this morning. Rather interesting/unusual and prominent pinkish extended cloud over the western side of Elysium, which also shows quite strongly in the IR. South Polar Hood is also prominent. Quite a distinct bright area in Hellas. Always fascinating, when the Gale crater extension from Mare Cimmerium is seen like this, to consider that Curiosity rover is operating in that little dark spot south of Elysium.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160409/CFs09Apr16.jpg>

○…*Subject: Re: Re: Mars 2016/04/10 0241UT*
Received: 11 April 2016 at 13:19 JST

Dear Reiichi, Thank you as always for your comments, and also for clarifying the issue of the "pink cloud", which as you have indicated appears to be an albedo feature. Interesting!

○…*Subject: Mars 2016/04/11 0254UT*
Received: 11 April 2016 at 13:29 JST

Hi all, Conditions quite a bit better this morning. Image a bit over processed, which is always tempting when conditions are a bit better. I have marked a feature on the eastern limb. It could be an artifact, but looks like it is "floating" slightly off the limb. Seems to be most evident in the G image. Reiichi KONNAI has kindly commented on the "Elysium Pink cloud", which he believes to be an albedo feature on the west flank of Elysium Mons and references one of Christophe's images from 6 March 2012, on the CMO LTe.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160411/CFs11Apr16.jpg>

○…*Subject: Mars 2016/04/13 0304UT*

Received: 14 April 2016 at 03:56 JST

Hi all, Mars this morning, in average seeing.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160413/CFs13Apr16.jpg>

○…*Subject: Mars 2016/04/14 0311UT*
Received: 14 April 2016 at 13:23 JST

Hi all, Mars this morning, in average seeing.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160414/CFs14Apr16.jpg>

○…*Subject: Mars 2016/04/15 0301UT*
Received: 15 April 2016 at 13:18 JST

Hi all, Mars this morning, in poor seeing. Olympus Mons coming into view.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160415/CFs15Apr16.jpg>

Clyde FOSTER (Centurion, SOUTH AFRICA)

●…*Subject: Mars, 16th March*
Received: 17 March 2016 at 07:44 JST

The north pole can be seen at the top, and some blue equatorial clouds can be seen across the disk, most visible over Syrtis Major as it sets at right. Hellas can just be seen at lower right as it sets, still full of bright cloud and frost. The plains of Arabia are prominent at the centre of the image.

<http://www.acquerra.com.au/astro/gallery/mars/20160316-182936/m20160316-182936utc.png>
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160316/AWs16Mar16.jpg>

○…*Subject: Mars, March 19*
Received: 20 March 2016 at 09:54 JST

Hi all, here's an image of Mars from this morning using an IR \geq 750nm filter. The seeing was not stable enough for a colour image, there were storms and unstable conditions around. Arabia is the bright feature at centre, with Chryse rising at left and Syrtis Major setting at right. Sinus Meridiani is the dark feature across the lower part of the image. The north pole is visible at top left (although muted through this filter) and Hellas basin at lower right can just be seen on the limb with some bright cloud or frost, again muted somewhat through the IR filter. regards,

<http://www.acquerra.com.au/astro/gallery/mars/20160319-191822/m20160319-191822utc.png>
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160319/AWs19Mar16.jpg>

○…*Subject: Mars, March 19 RGB*
Received: 20 March 2016 at 17:46 JST

Hi all, one more image from this morning. I'd originally thought the colour data would be very poor but after processing it seems to have come up ok. The north pole is visible on the limb at upper left and

Hellas at lower right is full of clouds. Some blue equatorial clouds can be seen across the disk, in particular across Syrtis Major at right.

<http://www.acquerra.com.au/astro/gallery/mars/20160319-184812/m20160319-184812utc.png>
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160319/AWs19Mar16.jpg>

○…*Subject: Mars, March 22*
Received: 23 March 2016 at 18:07 JST

Hi all, here's an image of Mars from this morning in poor seeing. Hellas basin is prominent at the bottom, full of clouds.

<http://www.acquerra.com.au/astro/gallery/mars/20160322-174506/m20160322-174506utc.png>
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160322/AWs22Mar16.jpg>

○…*Subject: Mars, March 23*
Received: 24 March 2016 at 13:30 JST

Hi all, here's an image of Mars from this morning in reasonably good seeing. Lots of cloud structure in Hellas at lower right, and the north pole is faintly visible at top left. Syrtis Major is prominent near the centre of the image.

<http://www.acquerra.com.au/astro/gallery/mars/20160323-183454/m20160323-183454utc.png>
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160323/AWs23Mar16.jpg>

○…*Subject: Mars, 27th March*
Received: 28 March 2016 at 11:54 JST

Hi all, here's a colour image of Mars from this morning. Bright cloud is visible in Hellas at lower left, but also some polar clouds to it's right, covering the south polar cap. Elysium is bright with some cloud at right of centre and there is some ill-defined sign of clouds over the volcanoes on the limb at upper right. Syrtis Major is rising at lower left and the north polar cap is just visible at upper left. regards,

<http://www.acquerra.com.au/astro/gallery/mars/20160327-185342/m20160327-185342utc.png>
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160327/AWs27Mar16.jpg>

○…*Subject: Mars, 1st April*
Received: 2 April 2016 at 10:50 JST

Hi all, here is a colour image of Mars from this morning in variable seeing. Many interesting features can be seen, from the bright pink/red Elysium just left of centre to the clouds over Olympus Mons at top right. The north pole is nearly invisible at top left, and clouds cover the south pole at bottom right.

<http://www.acquerra.com.au/astro/gallery/mars/20160401-185912/m20160401-185912utc.png>
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160401/AWs01Apr16.jpg>

○…*Subject: Mars animation, April 2*
Received: 3 April 2016 at 10:30 JST

Hi all, here's a 2-frame animation of Mars from this

morning through an Astrodon red filter. Interesting linear features are visible above and below Olympus Mons at upper right. The caldera of the volcano is vaguely seen as a dark spot. The animation makes it clear that these features are on the Martian surface and not camera artifacts as I initially thought likely. Animations are very good for telling what's real and what is not.

<http://www.acquerra.com.au/astro/gallery/mars/20160402-181300/mars-20160402-1813-1830-red.gif>

○…*Subject: Mars, April 15*
Received: 16 April 2016 at 11:12 JST

Hi all, here's a colour image of Mars from this morning. Seeing was variable and interrupted often by clouds. The north pole is visible at top left, Valles Marineris at lower centre, and a number of cloudy areas across the disk.

<http://www.acquerra.com.au/astro/gallery/mars/20160415-180230/m20160415-180230utc.png>
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160415/AWs15Apr16.jpg>

Anthony WESLEY (NSW, AUSTRALIA)

●…*Subject: Re: Fw: North Polar Spiral Cloud*
Received: 17 March 2016 at 19:50 JST

Dear Masatsugu, Thank you for sending this. Unfortunately the weather here has been quite poor of late; this morning was the first time in a while that I have been able to image Mars. Because I must leave for work early, I cannot capture the aspect shown in the Mars Express image at this time. Perhaps on the weekend if the weather is good. I have borrowed an ASI 224MC one-shot colour camera from a friend to try. It is remarkable how close to the eyepiece view that the resulting images are. Also remarkable is the fact that I was able to produce images from very ordinary seeing conditions. I used only 5% of the 30,000 frames in the capture for each time period.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160316/MV116Mar16.jpg>

○…*Subject: Mars 20th March 2016*
Received: 21 March 2016 at 20:00 JST

Hello all, Here are some Mars images taken on the 20th March UT in fair seeing.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160320/MV120Mar16.jpg>

○…*Subject: Mars 21st March 2016*
Received: 22 March 2016 at 18:52 JST

Hello all, Seeing was good this morning. Please find

attached some Mars images frm 21st March 2016 UT

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160321/MVI21Mar16.jpg>

○…**Subject: Mars 22nd March UT**
Received: 23 March 2016 at 19:05 JST

Hello all, This morning the seeing was very good despite high cloud being present. Attached are a number of images from data taken today. Note the two brighter 'spots' on the eastern edge of S. Major.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160322/MVI22Mar16.jpg>

○…**Subject: Mars 25th March 2016**
Received: 26 March 2016 at 08:45 JST

Some good seeing again this morning before the clouds rolled in. Attached is a composite of two images of Mars taken this morning. Best wishes

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160325/MVI25Mar16.jpg>

○…**Subject: Mars 30th March UT**
Received: 31 March 2016 at 18:44 JST

Hello all, Unfortunately this mornings imaging was hindered by a lot of cloud. I was not able to obtain a single video file of sufficient length to obtain a smooth image. Seeing appeared to be generally above average when Mars was visible, but overall contrast was low. I have attached a two image composite of Mars from the best data available. best wishes

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160330/MVI30Mar16.jpg>

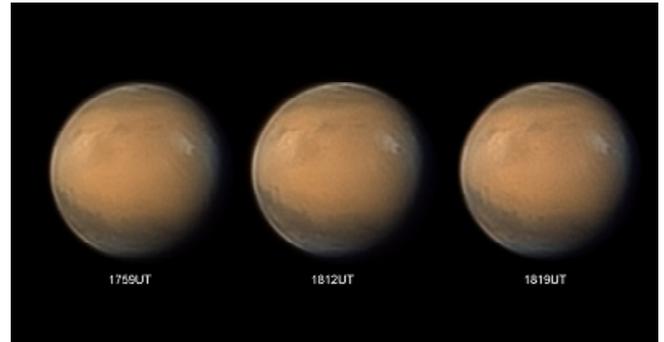
○…**Subject: Mars 31st March 2016**
Received: 1 April 2016 at 19:17 JST

Hello all, attached are two images of Mars taken through high cloud. Seeing was reasonable, but contrast was poor due to the conditions. As I was finishing my last set, the high cloud was clearing, but I could not continue to image due to work commitments. I have perhaps pushed the processing a little too far with these in order to try & reveal more of the differences in albedo of this aspect of Mars.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160331/MVI31Mar16.jpg>

○…**Subject: Mars 2nd April 2016**
Received: 4 April 2016 at 20:13 JST

Hello all, Attached is an image of Mars taken in good seeing on 2nd April UT as marked. I have also attached a small 4 image GIF of about 20min of Mars' rotation. There is also a 3 image side-by side slide for a pseudo stereo view (please excuse the north-up orientation of this one). Best wishes,



<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160402/MVI02Apr16.jpg>

○…**Subject: Mars 3rd April UT**
Received: 5 April 2016 at 19:23 JST

Hello all, I have attached some images of Mars taken on the 3rd April with Olympus Mons approximately on the CM.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160403/MVI03Apr16.jpg>

○…**Subject: Mars 6th April UT**
Received: 7 April 2016 at 22:45 JST

Hello all, Attached are some images of Mars taken on the 6th April UT as indicated. Seeing was fair to good for the session. I have also attached a small eight frame animation of the period from 1525UT to 1624UT showing Mars' rotation in that time. Solis Lacus looks quite undefined and there is much evening terminator haze/cloud from southern M. Erythraeum to Nilokeras/M.Acidalium.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160406/MVI06Apr16.jpg>

○…**Subject: Mars 8th April 2016**
Received: 9 April 2016 at 19:13 JST

Hello all, Seeing was quite good this morning & I have attached a small movie of Mars' rotation from 1525UT to 1644UT. Also, attached is a composite of six images that were part of the movie sequence.

Interesting dark 'ridge' in the South Polar Hood (?) at the southern edge of Solis Lacus.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160408/MVI08Apr16.jpg>

○…**Subject: Small NP disturbance?**
Received: 9 April 2016 at 20:30 JST

Hello all, After posting my images and animation from the 8th April, I noticed what appeared to be an artifact near the North Polar region of Mars. It appears in all images from the session. I thought it might be a processing artifact. After reprocessing the data with no multi alignment point registration, the artifact still persists. I therefore believe that it is real. Could some



one elaborate on what it might be? Please see the attached. Many thanks

Maurice VALIMBERTI (Melbourne, AUSTRALIA)

●.....*Subject: A Grin without a Cat*
 Received: 18 March 2016 at 01:30 JST

Dear all, The latest MRO MARCI Weather Report was released for the week of 7-13 March 2016. Every-day image of the week shows the afternoon remnants of the north polar spiral cloud, an almost dissipating annular cloud or arc-shaped fragments (an eye without a cyclone??). Attached here is a montage comparing the well-developed clear-eyed spiral cloud in the morning captured by Mars Express on 11 March and the dissipating remnants thereof depicted in the MRO MARCI image taken in the afternoon of the same day. A subtle eastward migration suspected?

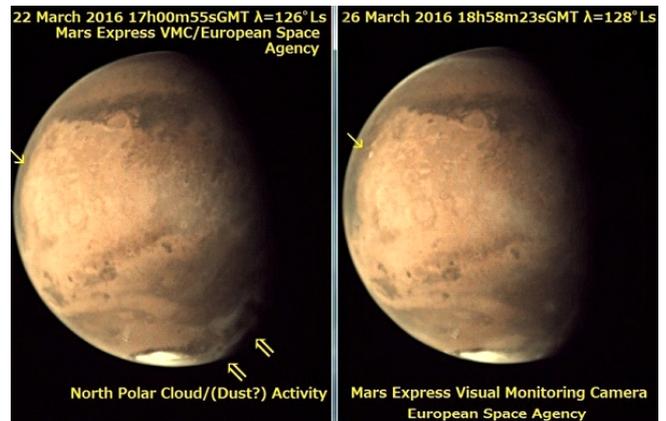


○.....*See also Kn's LtE in the preceding CMO #445*
 Received: 24 March 2016 at 20:08 JST
 (Subject: VMC images)

○.....*Subject: A Bright Patch West off Syrtis Major*
 Received: 28 March 2016 at 00:08 JST

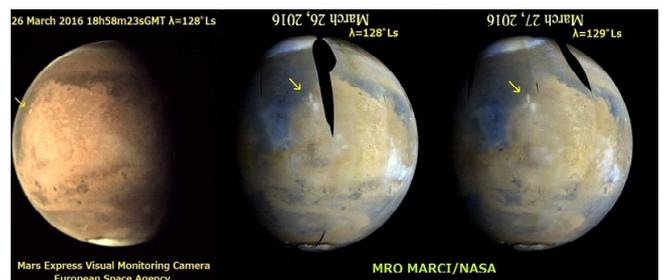
Dear all, On the latest Mars Image by ESA's Mars Express Visual Monitoring Camera taken on 26 March

2016, I noticed a roundish bright patch about one hundred km across just west off Syrtis Major mound (yellow arrow) which wasn't there four days before. Please find an attached montage. What on Mars was it!? The location seems to be near the crater Leighton, halfway between the great craters Huygens and Antoniadi.



○.....*Subject: A Bright Patch West off Syrtis Mj*
 Received: 1 April 2016 at 00:42 JST

Dear all, Please find an attached montage. The bright spot west off Syrtis Major captured by the Mars Express' visual monitoring camera on 26 March I mentioned in my LtE dated 28 March was also recorded in the image taken by the Mars Reconnaissance Orbiter's Mars Color Imager. Almost the same appearance of a bright patch was seen on the next sol as well.



○.....*Subject: Re: Mars 2016/04/10 0241UT*
 Received: 10 April 2016 at 20:47 JST

Hi Clyde, Your recent images are great! The Elysium "pink cloud" is not a cloud, it is actually an albedo feature, corresponding to the west flank of the Elysium rise as Christophe PELLIER pointed out. Please refer to the Solar&Planetary LtE Now for CMO#396, my LtE dated 06 March 2012, and Christophe's response dated 07 March:

http://www.kwasan.kyoto-u.ac.jp/~cmo/cmo/ISMO_LtE396.htm

In this apparition, Hecates Tholus, northern most of

the Elysium Volcano Trio appears fairly bright as well, often looks like a northeasterly short bright tail of the Elysium Mons. Good Seeing!,

Reiichi KONNAI (Fukushima, JAPAN)

●.....*Subject: Mars March 13th, 14th*
Received: 18 March 2016 at 08:31 JST

Hi Mr. Minami and All!, Here are my latest sessions of Mars on March 13th, 14th. and my latest session of Jupiter on march 16th.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160314/EMr14Mar16.jpg>
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160313/EMr13Mar16.jpg>

○.....*Subject: Mars March 18th*
Received: 20 March 2016 at 05:42 JST

Hi Mr. Minami and All!, Here is my recent session on march 18th and of Jupiter on the the 18th also.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160318/EMr18Mar16.jpg>

○.....*Subject: Mars 2016/03/28 0316UT*
Received: 28 March 2016 at 02:48 JST

Hi Mr. Minami and All!. Here I submit my most recent session on Mars on March 25th, 07:54 ut.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160325/EMr25Mar16.jpg>

○.....*Subject: Mars - Images*
Received: 14 April 2016 at 03:04 JST

Hi Mr. Minami and All!, here I submit my most recent images of Mars.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160409/EMr09Apr16.jpg>
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160408/EMr08Apr16.jpg>
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160404/EMr04Apr16.jpg>
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160403/EMr03Apr16.jpg>

Efrain MORALES (Aguadilla, Puerto Rico)

●.....*Subject: Mars images*
Received: 22 March 2016 at 07:40 JST

Dear Sirs, Please find the attached Mars image set from the 21st March 2016.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160321/MJs21Mar16.jpg>

○.....*Subject: Mars images*
Received: 24 March 2016 at 06:55 JST

Dear Sirs, Please find an attached Mars image set from the 20th March 2016. Seeing was at times very good.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160320/MJs20Mar16.jpg>

○.....*Subject: Mars images*
Received: 26 March 2016 at 10:56 JST

Dear Sirs, Please find an attached Mars image set from the 25th March 2016.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160325/MJs25Mar16.jpg>

○.....*Subject: Mars images*
Received: 2 April 2016 at 20:28 JST

Dear Sirs, Please find an attached Mars image set from the 31st March 2016. Apologises for only 30 minutes between the two sets.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160331/MJs31Mar16.jpg>

○.....*Subject: Mars images*
Received: 5 April 2016 at 23:46 JST

Dear Sirs, Please find an attached Mars image set from the 2nd April 2016.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160402/MJs02Apr16.jpg>

○.....*Subject: Mars Images*
Received: 15 April 2016 at 11:14 JST

Dear Sirs, Please find an attached Mars image set from the 3rd April 2016. Best regards,

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

Mark JUSTICE (Melbourne, AUSTRALIA)

●.....*Subject: Mars RGB set 20 March 2016*
Received: 22 March 2016 at 18:52 JST

Dear CMO, Please find attached my second image set for the apparition, captured in mediocre seeing.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160320/SBd20Mar16.jpg>

○.....*Subject: Mars 2016/04/8 0316UT*
Received: 9 April 2016 at 17:29 JST

Dear CMO, Please find attached an RGB set from this morning, captured in reasonably good seeing.

Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160408/SBd08Apr16.jpg>

Stefan BUDA (Melbourne, AUSTRALIA)

●.....*Subject: Mars Images*
Received: 23 March 2016 at 09:17 JST

Hello, This is my first post to CMO which I have been following for many years. Please let me know what data you want included or if there is a form report to include with the email with all data.Thank You

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160321/TW121Mar16.jpg>
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/160415/TW115Apr16.jpg>

Tim WILSON (Jefferson City, MO)

●.....*Subject: Mars 30 March 2016*
Received: 3 April 2016 at 06:32 JST

Dear MINAMI-sama, I have now chances to shoot Mars before dawn since the observation time of Jupiter has now ceased at around 28.5 hours Local Hawaii Time. On 30 March I tried to make the pictures of Mars by remote control by the use of the Coudé focus of the 60cm at Haleakala. Here are some examples of Mars images on 30 March 2016.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160330/As30Mar16.jpg>

○.....*Subject: Mars 2 April 2016*
Received: 3 April 2016 at 23:41 JST

These are taken on 2 April. They show the area of Olympus Mons and Tharsis Montes. Cloud distribution turned out to be rich.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160402/As02Apr16.jpg>

Tadashi ASADA (Fukuoka, JAPAN)

(Editor's Note): Dr T ASADA shoot Mars by using the Coudé focus of a 60cm telescope (see CMO #432) which is located on the summit of Mt. Haleakala of the Maui island, Hawaii. The Mars images are taken by a remote control of Dr. T. ASADA staying in Japan. The image-data are dispatched first from the Hawaii station to Japan, namely at the Planetary Plasma and Atmosphere Research Center of the Tohoku University, Japan, and then the data are directly transmitted to the computer of Dr. ASADA at Kyushu, Japan, to be processed.

●.....*Subject: Re: 2nd anniversary 28 March 2016*
Received: 3 April 2016 at 22:38 JST

Happy "anniversary" Clyde ! The work paid off and your images are really excellent. One nice thing to me is that you live in a country at similar Earth longitude

than Europe, so when it's hard for us to image Mars like this year, we are not going to lose data thank with yours :) Best wishes,

○.....*Subject: Re: A Bright Patch West off Syrtis Mj*
Received: 3 April 2016 at 22:39 JST

Hi Reiichi, Probably a very small dust cloud... best hypothesis I think !

Christophe PELLIER (Nantes, FRANCE)

●.....*Subject: Mars images (March 27th, 2016.)*
Received: 12 April 2016 at 05:51 JST

Hi all, Here are some Mars images from March 27th under excellent conditions. Best Wishes

RGB: <http://www.damianpeach.com/mars1617/2016-03-27-RGB.jpg>

Blue: <http://www.damianpeach.com/mars1617/2016-03-27-BLUE.jpg>

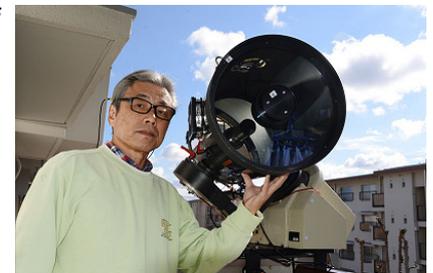
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160327/DPc23Mar16.jpg>

Damian PEACH (Selsey, West Sussex, the UK)

<http://www.damianpeach.com/>

●.....*Subject: Mars 2016/04/11-Kumamori*
Received: 12 April 2016 at 15:25 JST

We have also received emails from T KUMAMORI and Y MORITA written in Japanese. We will tell the news about them on another occasion. Here is a recent picture of Teruaki KUMAMORI (Km) and his C14.



International Society of the Mars Observers (ISMO)

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

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

CMO n°446/ ISMO #72 (25 April 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

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