

## MARS

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## OBSERVATIONS

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## Remote Imaging Jupiter and Mars at T60 Telescope on Haleakala, Maui, Hawaii

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*This Note is given as a sequel to my previous article about my trip to Haleakala, Maui, Hawaii, published in CMO n°432 (25 March 2015 issue).*

The 60cm reflector (T60) of the Tohoku University at Haleakala, Maui which I used has been designed to be completely computer controlled. Opening of the dome slit as well as the mirror cover is performed by just clicking the open buttons. We can choose the target on the computer monitor and click GOTO button to face the telescope to the target. Rotation of the dome is synchronized with telescope motion. The weather condition is evaluated by the humidity, and the dome slit remains to be closed if the humidity is exceeding 80%.

When I visited T60 in March 2015, I brought Takahashi TCA-4 camera adapter for imaging Jupiter. I needed to change filters by hand. Dr. KAGITANI of the Planetary Plasma and Atmosphere Research Center (PPARC), Tohoku University, said to me "You had better use electronic filter wheel."

I had an impression that an electronic filter

wheel was really convenient when Mr. Akinori NISHITA of the CMO Fukui brought it to the Hida Observatory of Kyoto University in May 2014. But the production of that filter wheel was already discontinued, so that I gave up this way. I investigat-



Fig.1. Filter-Wheel and WebCam

ed about it on several web pages, and found that one of the StarlightXpress seemed to be nice because it corresponds to ASCOM and we can use it on the button of FireCapture software.

There was another problem about the filter size. The size of filters is 1.25" for Astronomik LRGB Type 2c and 1" for IR and methane band. I took counsel to the Tomita telescopes shop where the StarlightXpress filter wheel was dealt with. Their solution was that 1" filter is fixed by 3 screws on the 1.25" wheel, and I asked to process it.

In September 2015, I visited again T60, carrying with me the filter wheel and a new web cam, ASI 120MM. I checked the motion of the filter wheel when I tried to image Saturn. On the next day, I could image Saturn again from the guest house in Kula, Maui. Some days later, after coming back to Japan, I could image Saturn from Munakata, Fukuoka Prefecture although the response was considerably slow.

I was worrying about data transfer of avi files. At Kula guest house, the WinSCP software works well to transfer data from Haleakala to Kula. But it seemed to take a long time from Haleakala to Japan. Dr. KAGITANI then advised me that I had better transfer files from Haleakala to Sendai once and then from Sendai to Munakata, because there is a US Air Force telescope facility at Haleakala.



That implies that the transfer speed is much higher from Haleakala to Sendai.

Fig. 2. Dr. KAGITANI of Tohoku University

It takes about 1.5 hours to transfer three 2.6 GB files of RGB and 3.9 GB file of L light from Sendai to Munakata where I live. I can use 2 WinSCP in almost the same speed as 1 WinSCP, so the real speed increased twofold.

After imaging Jupiter, I can transfer the image data files on the PC at Haleakala using rsync command of cygwin window to Sendai. Almost 2 hours later, I begin download those files from Sendai to Munakata. These download are accomplished while I take a sleep.

Until the middle of March, this year, there was no chance to image Mars because Dr. KAGITANI used the T60 for spectroscopy of Io's plasma torus. From the end of March, Dr. KAGITANI's job ended at 4:00 AM in Hawaii time, so I can image Mars from 4:00 AM to dawn. I am carrying out remote imaging Mars every 3 nights. Anyway, internet enables me to image Jupiter and Mars using Hawaii telescope from Japan. It should be a wonderful time. □

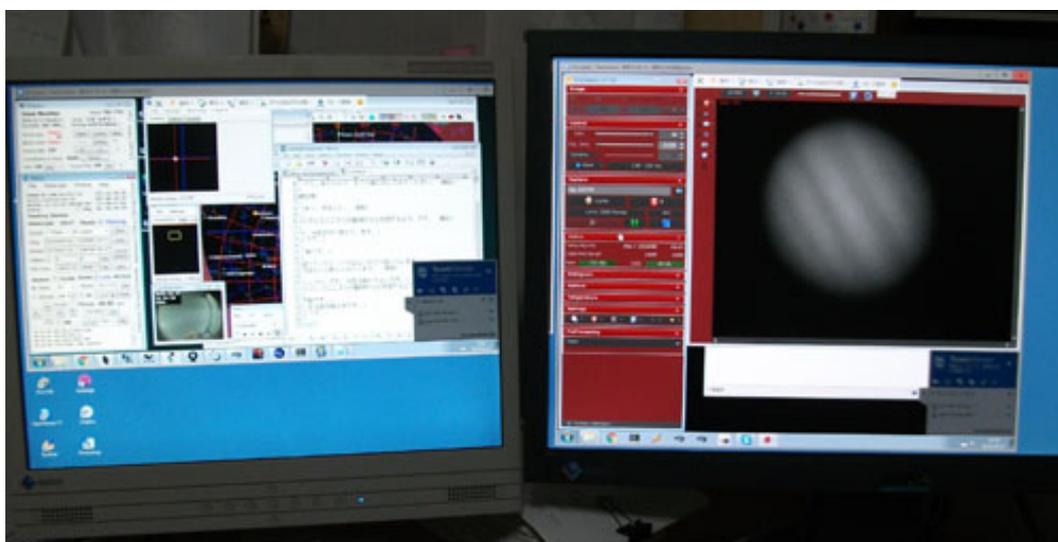


Fig. 3. PC monitors while imaging

## Forthcoming 2016 Mars (#10)

*Ephemeris for the Observations of the 2016 Mars. V**July & August 2016*

By

**Masami MURAKAMI**

**A**S a sequel to the preceding list (in CMO n°446) of the Ephemeris for the physical observations of Mars, we here list up the necessary elements of the Ephemeris for period from 01 July 2016 to 31 August 2016. The data are listed for every day at 00:00 GMT (not TDT). The symbols  $\omega$  and  $\phi$  denote the Longitude and Latitude of the sub-Earth point respectively. The symbols  $\lambda$ ,  $\delta$  and  $\iota$  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  $\Pi$  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)	$\omega$	$\phi$	$\lambda$	$\delta$	$\iota$	$\Pi$	D
01 July 2016	180.71°W	15.57°N	177.95°Ls	16.34"	30.1°	38.6°	-21°04'
02 July 2016	171.58°W	15.58°N	178.51°Ls	16.23"	30.7°	38.6°	-21°06'
03 July 2016	162.46°W	15.59°N	179.07°Ls	16.11"	31.2°	38.7°	-21°07'
04 July 2016	153.25°W	15.58°N	179.63°Ls	16.00"	31.7°	38.6°	-21°09'
05 July 2016	144.07°W	15.56°N	180.20°Ls	15.88"	32.2°	38.6°	-21°11'
06 July 2016	134.89°W	15.55°N	180.76°Ls	15.77"	32.7°	38.6°	-21°13'
07 July 2016	125.71°W	15.53°N	181.32°Ls	15.65"	33.2°	38.6°	-21°15'
08 July 2016	116.46°W	15.49°N	181.89°Ls	15.54"	33.7°	38.6°	-21°17'
09 July 2016	107.23°W	15.46°N	182.46°Ls	15.42"	34.1°	38.6°	-21°20'
10 July 2016	097.99°W	15.42°N	183.02°Ls	15.31"	34.6°	38.6°	-21°22'
11 July 2016	088.76°W	15.38°N	183.59°Ls	15.19"	35.0°	38.6°	-21°25'
12 July 2016	079.47°W	15.32°N	184.16°Ls	15.08"	35.4°	38.6°	-21°28'
13 July 2016	070.18°W	15.26°N	184.74°Ls	14.97"	35.8°	38.5°	-21°31'
14 July 2016	060.90°W	15.20°N	185.31°Ls	14.85"	36.2°	38.5°	-21°34'
15 July 2016	051.63°W	15.14°N	185.88°Ls	14.74"	36.6°	38.5°	-21°37'
16 July 2016	042.30°W	15.06°N	186.46°Ls	14.63"	37.0°	38.5°	-21°41'
17 July 2016	032.96°W	14.97°N	187.03°Ls	14.52"	37.3°	38.4°	-21°44'
18 July 2016	023.65°W	14.89°N	187.61°Ls	14.41"	37.7°	38.4°	-21°48'
19 July 2016	014.33°W	14.80°N	188.18°Ls	14.30"	38.0°	38.4°	-21°52'
20 July 2016	004.95°W	14.70°N	188.76°Ls	14.19"	38.3°	38.3°	-21°56'
21 July 2016	355.59°W	14.60°N	189.34°Ls	14.09"	38.7°	38.3°	-21°59'
22 July 2016	346.23°W	14.49°N	189.92°Ls	13.98"	39.0°	38.3°	-22°04'
23 July 2016	336.88°W	14.39°N	190.50°Ls	13.87"	39.3°	38.2°	-22°08'
24 July 2016	327.46°W	14.27°N	191.08°Ls	13.77"	39.6°	38.2°	-22°12'
25 July 2016	318.07°W	14.15°N	191.67°Ls	13.67"	39.9°	38.1°	-22°16'
26 July 2016	308.67°W	14.02°N	192.25°Ls	13.56"	40.1°	38.1°	-22°21'
27 July 2016	299.28°W	13.90°N	192.83°Ls	13.46"	40.4°	38.0°	-22°25'
28 July 2016	289.84°W	13.76°N	193.42°Ls	13.36"	40.7°	37.9°	-22°30'
29 July 2016	280.40°W	13.62°N	194.00°Ls	13.26"	40.9°	37.9°	-22°34'
30 July 2016	270.99°W	13.48°N	194.59°Ls	13.16"	41.2°	37.8°	-22°39'
31 July 2016	261.55°W	13.34°N	195.17°Ls	13.06"	41.4°	37.8°	-22°44'

Date (00:00GMT)	$\omega$	$\phi$	$\lambda$	$\delta$	$\iota$	$\Pi$	$D$	
01 August 2016	252.09°W	13.18°N	195.76°Ls	12.97"	41.6°	37.7°	-22°48'	
02 August 2016	242.63°W	13.02°N	196.35°Ls	12.87"	41.9°	37.6°	-22°53'	
03 August 2016	233.16°W	12.86°N	196.94°Ls	12.78"	42.1°	37.5°	-22°58'	
04 August 2016	223.70°W	12.70°N	197.53°Ls	12.68"	42.3°	37.5°	-23°03'	
05 August 2016	214.20°W	12.53°N	198.12°Ls	12.59"	42.5°	37.4°	-23°08'	
06 August 2016	204.70°W	12.35°N	198.72°Ls	12.50"	42.7°	37.3°	-23°13'	
07 August 2016	195.21°W	12.18°N	199.31°Ls	12.41"	42.8°	37.2°	-23°18'	
08 August 2016	185.74°W	12.00°N	199.90°Ls	12.32"	43.0°	37.1°	-23°23'	
09 August 2016	176.20°W	11.81°N	200.50°Ls	12.23"	43.2°	37.0°	-23°28'	
10 August 2016	166.69°W	11.62°N	201.10°Ls	12.15"	43.4°	36.9°	-23°33'	
11 August 2016	157.18°W	11.43°N	201.69°Ls	12.06"	43.5°	36.8°	-23°38'	
12 August 2016	147.67°W	11.24°N	202.29°Ls	11.97"	43.7°	36.7°	-23°42'	
13 August 2016	138.11°W	11.04°N	202.89°Ls	11.89"	43.8°	36.5°	-23°47'	
14 August 2016	128.58°W	10.83°N	203.49°Ls	11.81"	44.0°	36.4°	-23°52'	
15 August 2016	119.04°W	10.63°N	204.09°Ls	11.72"	44.1°	36.3°	-23°57'	
16 August 2016	109.52°W	10.42°N	204.69°Ls	11.64"	44.2°	36.2°	-24°02'	
17 August 2016	099.94°W	10.20°N	205.29°Ls	11.56"	44.3°	36.0°	-24°07'	
18 August 2016	090.38°W	09.98°N	205.90°Ls	11.49"	44.5°	35.9°	-24°12'	
19 August 2016	080.82°W	09.76°N	206.50°Ls	11.41"	44.6°	35.8°	-24°16'	
20 August 2016	071.28°W	09.54°N	207.10°Ls	11.33"	44.7°	35.6°	-24°21'	
21 August 2016	061.70°W	09.31°N	207.71°Ls	11.26"	44.8°	35.5°	-24°26'	
22 August 2016	052.11°W	09.08°N	208.32°Ls	11.18"	44.9°	35.3°	-24°30'	
23 August 2016	042.55°W	08.85°N	208.92°Ls	11.11"	45.0°	35.2°	-24°34'	
24 August 2016	032.98°W	08.62°N	209.53°Ls	11.03"	45.1°	35.0°	-24°39'	
25 August 2016	023.38°W	08.38°N	210.14°Ls	10.96"	45.2°	34.8°	-24°43'	
26 August 2016	013.76°W	08.13°N	210.75°Ls	10.89"	45.3°	34.7°	-24°47'	
27 August 2016	004.17°W	07.89°N	211.35°Ls	10.81"	45.3°	34.5°	-24°52'	
28 August 2016	354.60°W	07.64°N	211.96°Ls	10.74"	45.4°	34.3°	-24°56'	
29 August 2016	344.97°W	07.39°N	212.57°Ls	10.67"	45.5°	34.1°	-25°00'	
30 August 2016	335.35°W	07.14°N	213.19°Ls	10.61"	45.6°	33.9°	-25°03'	
31 August 2016	325.75°W	06.88°N	213.80°Ls	10.54"	45.6°	33.7°	-25°07'	
01 September 2016	316.16°W	06.63°N	214.41°Ls	10.47"	45.7°	33.5°	-25°11'	- - -

### CMO/ISMO 2016 Mars Report #09

## 2016 CMO/ISMO Mars Observations Made During the Fortnight Period from 16 May ( $\lambda=153^\circ$ Ls) to 31 May ( $\lambda=162^\circ$ Ls) 2016

♂..... We here deal with the 9<sup>th</sup> ISMO Report of the worldwide observations of Mars made by the ISMO members during the fortnight period from 17 May to 31 May 2016. During the period, the planet was at opposition on 20 May at 11:11 GMT, and was closest to the Earth on 30 May at 21:36 GMT and the angular diameter of Mars reached  $\delta=18.6$  arc-seconds which was realized for the first time in ten years (since 2005). The planet retrograded celestially during the period from the Sco to the Lib constellation, and the apparent declination  $D$  of Mars remained at  $21^\circ$ S, that implying Mars must be very lower if observed from the terrestrial northern hemisphere. The angular diameter went up from  $\delta=17.9''$  to  $18.6''$  and remained the same until the beginning of June. The tilt was  $\phi=09^\circ$ N to  $12^\circ$ N, so that the residual north polar cap (npc) declined a bit to face towards us. The phase angle decreased from  $\iota=06^\circ$  to the lowest  $01^\circ$  and went up again

to 08° (that is, the defect illumination moved to the morning side). During the period, the Martian season proceeded from  $\lambda=153^\circ\text{Ls}$  to  $\lambda=162^\circ\text{Ls}$ , a very important period as noted below (N.B.1). The south polar cap (spc) will soon poke out and the season of dust disturbances is ahead. In 1971, Dr Shotaro MIYAMOTO (1912~1992)[who started his Mars observations in 1971 on 30 December 1970 ( $\lambda=111^\circ\text{Ls}$ ) and ended with the 571<sup>st</sup> drawing on 24 May 1972 ( $\lambda=033^\circ\text{Ls}$ ) at the Kwasan Observatory, Kyoto University, by the use of a 45 cm Zeiss refractor] recorded that he saw visually the spc for the first time at  $\lambda=161^\circ\text{Ls}$  when  $\delta=8.7''$ ,  $\phi=10^\circ\text{S}$ .

♂..... During the present fortnight period, the number of the observations received increased, but the veterans in Europe and the US stay inactive, perhaps because of the low altitude of Mars. In contrast, the observers in the southern hemisphere continue to yield valuable information. Especially we are indebted to the observers in Australia for several pieces of precious information of high accuracy. The observations received concerning this fortnight period amounted to a total of 109 from 26 observers. The observers and the instruments they used are as follows. We are sincerely thankful to the observers who thus contributed.

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

9 RGB Colour + 9 B + 9 IR Images (18, 19, 23\*, 25, 28\* May 2016)

36cm SCT, 40cm Cassegrain\* with an ASI174MM

**ASADA, Tadashi (As)** Fukuoka, JAPAN

1 Set of RGB Images (27 May 2016) PPARC# 60cm Reflector with an ASI120MM

**BUDA, Stefan (SBd)** Melbourne, AUSTRALIA

4 Sets of RGB Images (20, 24, 27, 30 May 2016) 41cm Dall-Kirkham with an ASI120MM

**FERNÁNDEZ Navarro, Luis (LFn)** Bormujos, Sevilla, SPAIN

2 Colour Images (21, 28 May 2016) 20cm SCT with an ASI120MC

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

9 Colour + 9 IR Images (21,~24, 26, 28, 29 May 2016) 36cm SCT @f/33 with an ASI224MC

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

6 Sets of RGB + 6 IR images (20, 23, 27, 29 May 2016) 36cm SCT @f/11 with an ASI290MM

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

5 Colour Images (18, 22 May 2016) 31cm Spec, with a SONY HC9 Video Cam

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

8 Sets of RGB Images (20, 24, 30 May 2016) 30cm Spec with a DMK21AU618

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

1 Colour + 1 IR Images (28 May 2016) 36cm SCT with a DBK21AU618

**KOWOLLIK, Silvia (SKw)** Ludwigsburg, GERMANY

1 Colour image (21 May 2016) 15cm Macsutov Cassegrain with an ALCCD5L-IIc

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

9 LRGB + 9 B Images (18, 20,~23, 28, 30 May 2016)

36cm SCT @ f/30 with an ASI224MC & ASI178MM

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

5 Colour Images (17, 20, 21, 26, 29 May 2016) 25cm SCT with a ToUcam pro II

**MILES, Phil (PMI)** QLD, AUSTRALIA

1 Set of RGB + 1 L + 1 IR Image (18 May 2016) 51cm Spec, with a Grasshopper3 GS3-U3-3254M

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

9 Sets of RGB Images (18, 20,~24, 29,~31 May 2016) 31cm SCT with a Flea 3

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

2 Sets of LRGB Images (21, 26 May 2016) 36cm SCT with a Flea 3

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

1 Set of RGB Images (20 May 2016) 20cm refractor\* with a Skyris 618M  
\* Fukui City Museum of Natural History Obsavarty, Fukui, Japan

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

3 Colour Images (18, 20, 28\* May 2016) 25cm Dall-Karkham with an ASI224MC & ASI290MC\*

**ROSOLINA, Michael (MRs)** Friars Hill, WV, the USA

1 Colour Drawing (25 May 2016) 35cm SCT, 330×, 390×

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

1 Colour Image (26 May 2016) 20cm SCT with an ASI 224MC

**SUSSENBACH, John S (JSb)** Houten, the NETHERLANDS

2 RGB Colour Images (26, 31 May 2016) 36cm SCT @f/18 with a QHY5L-II

**VALIMBERTI, Maurice (MVI)** Melbourne, AUSTRALIA

10 Sets of RGB + 10 IR Images (20, 24, 27, 30 May 2016) 36cm SCT @f/24 with an ASI120MM

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

2 Sets of RGB Images (20, 27 May 2016) 22cm speculum @f/23, 30 with a DBK21AU618

**WELDRAKE, David (DWd)** NSW, AUSTRALIA

4 Sets of RGB Images (20, 23 May 2016) 13cm refractor @f/40 with an ASI120MM

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

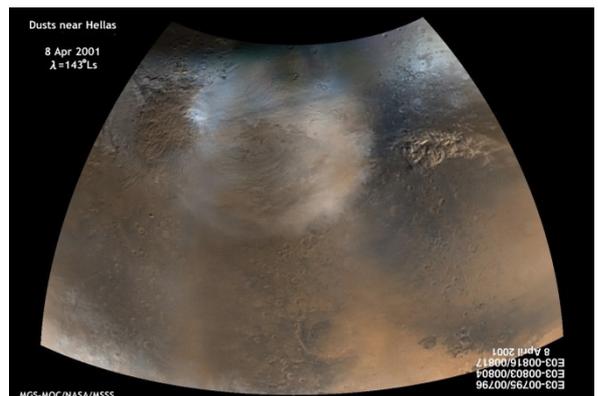
1 Colour Image (17 May 2016) (51cm Spec)

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

2 Colour + 2 IR Images (19, 22\*, 23, 29\* May 2016) 28cm SCT with an ASI120MC & ASI120MM\*

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

♂.....**N.B. 1:** (This NB column is written by *Mn*). The Martian season has reached at last  $\lambda=150^\circ\text{Ls}$ . The period  $\lambda=145^\circ\text{Ls}\sim\lambda=150^\circ\text{Ls}$  designates for instance the transition moment when the south polar cap (spc) recovers a roundish structure under the southern polar hood (sph) which sometimes we nominate "south polar canopy" (cf a Figure in CMO #353 at page Ser2-1022). This is also the season when some minor dust disturbances frequently occur at the high-latitude area of the southern hemisphere. If the season is close further to  $\lambda=180^\circ\text{Ls}$  (northern autumnal equinox), the water vapour which flows along around the equatorial zone decreases and soon the season of the southern dust storms comes. In 2001, we had an interesting apparition when we encountered an amazingly large/global dust covering which was onset as early as at  $\lambda=184^\circ\text{Ls}$ . At present, this mile-stone season is still ahead, but in 2001 already at  $\lambda=143^\circ\text{Ls}$  it was brought a news by the MGS that some small dust disturbances occurred at Noachis as well as to the east of Hellas as shown in the Figure here (on 8 April 2001: South is up, and at the bottom the Huygens crater is visible, followed by the eastern tail of S Sabæus). Note that at this moment the frosty areas inside the basin still remain. Even if the bottom of the Hellas basin is free from the frost, the dust disturbances



inside could not be sent up to the outside of Hellas because the bottom is very deep and hence the pressure covering the basin is too high. However on the surface level it is quite possible for the airborne dusts caused by the minor dust devil disturbances to flow out from the time around  $\lambda=150^\circ\text{Ls}$  to pollute the Martian atmosphere. As shown in 2001, if a global dust storm governs, the seasonal events depending on the water vapour will soon cease.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmohk/268Note15/index.html>

So it is quite probable within the present period for us to have some observations of the effect of the airborne dusts. However in some cases some immature images may happen to suggest a dirty air and so, conversely, it may be sometimes difficult to point out the real covering by airborne dusts even if we sincerely try to avoid overlooking the case. The present writer (*Mn*) experienced in 2003 around  $\lambda=210^\circ\text{Ls}$  to feel visually night after night that the Martian surface looked quite dirty. However suddenly on 4 July 2003 ( $\lambda=215^\circ\text{Ls}$ ) at  $\omega=336^\circ\text{W}$  the present writer recognised how it had looked dirty or how it differed from the cleaner state. At the very moment the present writer witnessed an occurrence of a definite dust storm which divided Sinus Sabæus clearly into two: The following side including Sinus Meridiani appeared then clearly dark with a vivid chocolate colour and the deserts to the north of S Meridiani was beautifully reddish. That implied that the following area recovered a clear air governed by a strong descending atmosphere to have driven the airborne dusts as well as the floating aerosols blown to the preceding S Sabæus area + the eastern area of Deucalionis Regio which were apparently governed by the low pressure (ascending) dusty area. See the item "14 July" of the following url (CMO #275 10th Report) :

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmomn3/275OAA/index.htm>

♂..... We shall now start reviewing the ISMO observations made during the fortnight period chronologically from 17 May to 31 May 2016. We hope you will refer to the images in the Gallery of 2016 Mars:

[http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/f\\_image.html](http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/f_image.html)

**17 May 2016 ( $\lambda=154^\circ\text{Ls}$ ,  $\delta=18.0''\sim 18.1''$ ,  $\phi=10^\circ\text{N}$ )**

**Frank MELILLO (FMI)** in NY took a colour image at  $\omega=292^\circ\text{W}$ ,  $\phi=10^\circ\text{N}$ . Syrtis Mj is seen near the CM and several other dark markings are checked. The sp canopy is not clear so that it is uncertain whether the canopy still invades Hellas or not.

**Anthony WESLEY (AWs)** in Australia produced a big excellent RGB image at  $\omega=093^\circ\text{W}$ . The phase angle is  $\iota=04^\circ$  just before opposition and because of an opposition effect, the description may lack in punch, but the depiction of small deep dots is definite. The inside of Solis L shows a nice structure with light and shade, and this is the first time for us to be able to allude to a delicate frame around Aurea Cherso ever since 2003. The angular diameter is  $\delta=18''$ , largest for the first time in the last decade so that the structures of Auroræ S, Agathodæmon and Tithonius L are detailed. A minor network inside Ophir is also visible. To the north of Ophir, there is seen a mist patch. The support canal Bætis (doubled?) of Iuventæ Fons also looks misty. M Acidalium is beneath the evening mist which is connected with the mist at Xanthe though avoiding the Solis L area. The south polar covering mist goes down to the line at  $55^\circ\text{S}$ , but does not show the central brightness. The south of the eastern tail of M Sirenum is thickly gaseous. The annular plateau of Olympus Mons is definite with a central peak on the morning side. Tharsis Montes are seen weakly, and the light ring of Pavonis Mons is obvious. The annular ring of Ascræus

Mons is deformed, and no Ascræus cloud is seen from this angle. There are a series of small white frost dots at the SW neighbourhood of the north polar cap (npc).

**18 May 2016 ( $\lambda=154^\circ\text{Ls}$ - $155^\circ\text{Ls}$ ,  $\delta=18.1''$ - $18.2''$ )**

**Efrain MORALES (EMr)** from Carib obtained a set of R, G, B ingredients and composed an RGB image at  $\omega=291^\circ\text{W}$ . The dark markings look rather blackish and not so edged. But because of R and G images, the area of the Baldet/Antoniadi craters at the northernmost district of Syrtis Mj is well shown (though not perfect). The effect of the B image is beautifully shown on the distribution of white mists at the peripheral region of the disk: The Elysium cloud is bright at the evening terminator and from Elysium the evening mist ascends southwards crossing M Cimmericum and Hesperia and further to Syrtis Mj, but Syrtis Mj is too dark to chase the mist. On the morning side to the north of Ismenius L, there runs a broad mist band upto Boreosyrtis. Inside Utopia there is seen a misty patch. The morning Deucalionis R to Noachis is also misted. The inside of Hellas looks almost dried up at this season but the ES end of Hellas looks covered by the thick gaseous matter which is brightest. At around  $\lambda=160^\circ\text{Ls}$ , the asymmetry of the spc (south polar cap) must be broken and the perimeter is expected to retreat to  $55^\circ\text{S}$ . However due to the tilt and obliqueness, it will be much later to be able to detect the spc.

**Tsutomu ISHIBASHI (Is)** obtained a colour image (thru Video) at  $\omega=053^\circ\text{W}$ . S Meridiani is visible near the preceding terminator separated from Margaritifer S. Other details are scarcely detected. The south polar hood (sph) is largely described.

**Teruaki KUMAMORI (Km)** gave two sets of L-colour and B images at  $\omega=056^\circ\text{W}$  and at  $\omega=079^\circ\text{W}$ . According to Km, the seeing condition was better, but he looks to have expected too much. For instance, the depiction of the area around Tithonius L on the second  $\omega=079^\circ\text{W}$  image shows several dark spots to be accompanied by strangely bright fringes. These suggest that the procedure was excessive and made the ghost images. Also the first image at  $\omega=056^\circ\text{W}$  suggests an excessive processing. The faint appearance of M Acidalium has some reasons of itself (for example the opposition effect at  $\iota=03^\circ$ ), and here we should keep a description made by the processing of mild gradation. However these show some other successful results: The L-colour image at  $\omega=056^\circ\text{W}$  is successful in showing some newly recorded details around Iaxartes and Hyperboreus L, and though Brangæna is quite mediocre, but Neudrus double canals show their extension surprisingly upwards clearly up until the neighbourhood of the sph. The sph shows a concentration near its centre.

**Tadao OHSUGI (Og)** obtained a 224MC colour image at  $\omega=057^\circ\text{W}$  by the use of a 25cm Meulon. This image belongs to the first-class category since it depicts almost whole necessary markings: It really suggests an internal structure of Solis Lacus, the minor markings at the area of Auroræ Sinus, and the southernmost complex of Chryse, the doubled branches of Nilokeras and so on. However the dark spots and canals are depicted too thick and the black colour looks to prevail. Contrarily, the whiteness of the south polar hood is lacked. By the way, we would like to point out that the images by Paul MAXON (PMx) who uses the same telescope as Og could be suggestive to this author (Og): For instance PMx's image made on 10 May 2016 ( $\lambda=150^\circ\text{Ls}$ ,  $\delta=17.3''$ ) at  $\omega=039^\circ\text{W}$  will be useful as a reference. On the RGB image, due to the effect of the B image, the sph is described whitish and the vast area to the north of M

Erythræum is depicted nicely with a moderate light and shade. Iuventæ Fons is also shown plainly (not so thick).

**Tomio AKUTSU (Ak)** at home gave two sets of RGB, B and IR images at  $\omega=083^\circ\text{W}$  and at  $\omega=093^\circ\text{W}$ . The B images are not good in the sense they will not produce a whiteness of the sph. On the IR images the dark markings look dense but blurred: The position of Olympus Mons is suggested, but the RGB does not show such details and any opposition effect.

**Phil MILES (PMI)** from Australia produced an excellent set of the R, G, B components to make an RGB composite at  $\omega=094^\circ\text{W}$ . Further they are associated with the L image as well as two IR images (IR685, IR700). The three ingredients are beautifully accomplished. Though  $\iota=03^\circ$ , Ophir does not look so bright in every component. Just the B shows a small white patch at the northern exit of Ophir. The annular aspects of Olympus Mons et Tharsis Montes are moderately shown. Because the processing is not excessive, the useless rings are not shown. The ring of Olympus Mons is vivid in R and G. The ring looks ecliptic because it is still on the morning side. In R and G, the Fortuna ring marking is shown. Solis L shows its internal structure. Aurea Cherso to Auroræ S and some other derived markings look to consist of smaller dots. In RGB, Solis L is not completely free from a weak mist. Thaumasia is very narrow and filled with a mist. A considerably thicker mist zone (maybe a part of the sph) runs horizontally to the south of the Solis L area. It is very apparent in G and B. The evening terminator side is misty: It is misty thicker at Xanthe and the mist covers M Acidalium. Tempe shows another mist patch. The description of the area of the npc is superb. The IR685 image is milder than the other. This apparition, the canal Phasis remains invisible so far.

**19 May 2016 ( $\lambda=155^\circ\text{Ls}$ ,  $\delta=18.2''$ )**

**Tim WILSON (TWI)** gave a 120MC colour image at  $\omega=290^\circ\text{W}$ . The usual details of Syrtis Mj and others are shown. However the image suffers from chromatic aberration, and furthermore the description of the whiteness is very weak. Perhaps the IR filter is used in a wrong way.

**Ak** gave a set of LRGB like colour image with B and IR at  $\omega=081^\circ\text{W}$ . Solis L is near the CM, while no detail of the disk in general including the aspect of the sph is associated.

**20 May 2016 ( $\lambda=155^\circ\text{Ls}$ - $156^\circ\text{Ls}$ ,  $\delta=18.2''$ - $18.3''$ )**

**Peter GORCZYNSKI (PGc)** took a set of RGB at  $\omega=260^\circ\text{W}$ , and ten minutes later two kinds of IR images. We are really sorry to hear that this apparition the altitude of the planet is quite low from PGc's observation site. PGc has remained providing us excellent images for a long time. However the disks of the R and IR images here suffer from a set of strange vibrating streaks to the SW $\leftarrow$   $\rightarrow$ NE direction. This is not because of the filters (the two IR filters are those made by different makers). Otherwise, the B image shows clearly the cloud at Elysium Mons, and the R image proves the double split of the Ætheria dark patch. The area of the npc may show a small blow-off.

**EMr** made an RGB composite image at  $\omega=265^\circ\text{W}$ . The G and B images produce bright whiteness to show the brilliant part of the sph, the white cloud on Elysium Mons (in good contrast with the pinkish

streak at the westernmost coast of Elysium) and the arctic cloud near (beyond Rima Borealis) the npc. The evening and morning mists look rather faint (perhaps due to  $i=02^\circ$ ). The dark markings are detailed, though not edged enough.

**Frank MELILLO (FMI)** gave a mild colour image at  $\omega=281^\circ\text{W}$ . The deserts and Syrtis Mj show nicely a Martian tint. The cloud at Elysium is white near the evening terminator. The arctic white cloud shown in EMr's image makes the area of the npc favourably blurred.

**David WELDRAKE (Dwd)** issued three elaborated sets of R, G, B images and the RGB composites at  $\omega=356^\circ\text{W}$ ,  $\omega=002^\circ\text{W}$ ,  $\omega=010^\circ\text{W}$ . The size employed is smaller but well organised. Brangæna follows the nailed Aryn. Syrtis Mj is now quite near the evening terminator but nearly follows a narrow streak of the evening mist which remains nearly one-hour. The npc is also definite adjacent to Hyperboreus L. The sph is beautifully shown on G and B images, and looks thicker at/near Argyre.

**Maurice VALIMBERTI (MVI)** delivered a gif moving composed image starting from 10:46 GMT to 14:01 GMT (which is shown up on the Façade of CMO/ISMO web). Here MVI lined up four sets of R, G, B and IR images together with RGB composites at 12:20 GMT ( $\omega=016^\circ\text{W}$ ), 12:53 GMT ( $\omega=024^\circ\text{W}$ ), 13:49 GMT ( $\omega=038^\circ\text{W}$ ), and at 13:59 GMT ( $\omega=041^\circ\text{W}$ ). In R, S Meridiani together with Brangæna and Aram Chaos is clearly seen. The Neudrus double canals are shown up beyond Pandoræ Fr. Oxus turned out to be made of small dots, not simply a line. The Oxus dark segment (Ods) is visible in every R (so also in each RGB). In RGB, the moving of Iaxartes together the following mist is checked. The inside of the sph is still complex, but looks to cover Argyre (no longer frosty deposit is supposed to exist). The whiteness may be slightly off-white. Ophir is not particularly bright. It shows a minor network inside Ophir at  $\omega=038^\circ\text{W}$ . The IR images cover all of the details of the dark markings. Finally we are sure these images all suggest a covering by airborne dusts.

**Stefan BUDA (SBd)** spent a time for observation after a fortnight, and gave a set of R, G, B ingredients and their RGB composite at  $\omega=036^\circ\text{W}$ . Such renowned minor markings as Neudrus canals, Aram Chaos, the Ods and so on are shown up as in MVI's images, while the vast area to the north of M Erythræum looks more nuanced and milder, that is, some light and shade variation governs the inside of the slightly misty vast area. This reminds us of the case performed by Paul MAXON (PMx) on 10 May ( $\lambda=150^\circ\text{Ls}$ ,  $\delta=17.3''$ ) at  $\omega=039^\circ\text{W}$ . SBd's depiction of the area of the npc is plausible, and the description of the sph is natural. The G and B images together with R well show the uneven distribution of antarctic gaseous. This work is superb and together with MVI's work suggests that the whole sphere is governed by faint airborne dusts.

**Og** gave a 224MC colour image at  $\omega=040^\circ\text{W}$ . Several minor markings are nicely exposed including Aurea Cherso, while they are too thickly depicted and the colour looks monotonous in general. The depiction of the white matters through B, CO<sub>2</sub> gaseous or H<sub>2</sub>O condensate, is too weak.

**Mark JUSTICE (MJs)** issued a couple of the RGB images at  $\omega=041^\circ\text{W}$  and  $\omega=052^\circ\text{W}$ . The depiction in R of the fine structures is satisfactory, though the sharpness seen in R has been a bit weakened in RGB.

A remarkable point is around the Ods which is on the brink of the excessive expression. The fine network from Solis L to Aurea Cherso is attractive. The Fortuna double structure is also apparent. At  $\omega=052^\circ\text{W}$ , (though the ghost arc at the morning limb is annoying) at least two summits of Montes (possibly Arsia and Pavonis) poked out in a brownish tint from the morning mist layer. Not sure but Ascræus Mons may be outside the morning mist. The depiction of the whiteness from the sph to the morning mist is beautiful. In G and B, the mist or gaseous shows a complex uneven distribution of whiteness density. The general transparency of the disk looks a bit poorer than usual, similar to the above MVI and SBd cases.

**Km** gave an L-colour image at  $\omega=053^\circ\text{W}$  and a B image at  $\omega=058^\circ\text{W}$ . The L-colour looks in general very detailed. However, as Brangæna shows, minor markings give us an impression they are not well edged. According to Km, the sky was fine but the atmosphere was being disturbed by a cold air flow. The angle  $\omega=053^\circ\text{W}$  is the same as MJs' second case, but it is not easy to unearth the summits of Tharsis Montes. A small white cloud on the evening terminator preceding the northern end of M Acidalius is shown as in the case of MJs. The poking out of the summits is usually darkly visible on the B image, as in the case of the above MJs case, but Km's B does not look to show them.

**Akinori NISHITA (Ns)** gave a set of three colour ingredients to compose an RGB image at  $\omega=070^\circ\text{W}$ . The night, one of the present writers (Mn) was with Ns inside/outside of the dome to check any glint, but it was pitiful to Ns because the seeing condition remained terrible. So Ns should appreciate the help of a stakkert since the images express a rough aspect of the sph. Just Ns needs to be not excessive in the R description and also pay closer attention to the B ingredient. The RGB looks to have lost a colour balance.

**Johan WARELL (JWr)**, an old friend of the OAA/CMO from Sweden, now a professional astronomer, but he observes Mars as an amateur. He led "*Nordic Mars Observers*" with Elisabeth SIEGEL (ESg) until she unfortunately fell ill. This set of images was take at  $\omega=163^\circ\text{W}$  by the use of a 22cm spec. In spite of the low altitude of the planet, the cloudy Olympus Mons is apparent especially in B near the evening terminator, and Elysium is light in R near the morning limb. The sph must be declined to the west seen from this angle. The area between M Sirenum and M Cimmerium is shown up. Propontis I is definitely dark. The area of the npc looks ballooned.

**21 May 2016 ( $\lambda=156^\circ\text{Ls}$ ,  $\delta=18.3''-18.4''$ )**

**Luis FERNÁNDEZ (LFn)**, from Spain, obtained a small colour image at  $\omega=186^\circ\text{W}$  by the use of a 20cmSCT and 120MC. Propontis I is checked near the CM and the light Elysium is bounded by the Ætheria dark patch. The area of the npc is light. Hoped the size of the image should be larger.

**FMI** gave a single colour image at  $\omega=244^\circ\text{W}$ . Elysium is light on the evening side and Syrtis Mj is evident near the morning limb. Its eastern neighbour is a bit light. No details are given of the sph.

**EMr** obtained an excellent set of R, G, B ingredients and composed an RGB image at  $\omega=253^\circ\text{W}$ . The R image is of high quality and shows an interesting detail of the NW part of M Cimmerium. The details around Syrtis Minor look also interesting. The dot distribution inside Hesperia is also remarkable. The

western end of Ausonia Australis reminds us of the aspect seen several years ago. The Ætheria dark patch is spilt into two canals and its immediate east side streak is very ground-lit (pinkish in RGB. In RGB, the cloud over Elysium Mons is whitish evident, but gives no sign in R). Hellas is plain and is far from the whitish brightest part of the sph. A part of the spc might have been faced toward us? The npc is evident, while a cloud projection at the eastern side is much whiter. The RGB image does not make us noticeable about the atmospheric dirtiness.

**Yukio MORITA (Mo)** sent us a series of the LRGB, RGB, R, G, B, and L images at  $\omega=017^\circ\text{W}$ . He complains how terribly the poor seeing condition remains this apparition. The shape of S Meridiani is cool with Brangæna and the R image suggests the presence of the Ods, but any marking looks blurred and does not show the "edges". On RGB, the npc is visible and the brightest part of the sph is just around south of Argyre.

**Km** obtained two sets of the L-colour and the B image at  $\omega=023^\circ\text{W}$  and at  $\omega=050^\circ\text{W}$ . The seeing is said unstable. Out of two, the latter L-colour image shows quite details. However, for example, the brownish Brangæna does not grow longer. Neudrus canals are visible. S Meridiani near the terminator may be receiving a mist. The description around the npc and Hyperboreus L is interesting. The expression around Tithonius L looks excessive, though the area of Ascræus Mons is vague. It must be clear in B, but the B image itself is totally blurred. The light and shade of the south polar gaseous is interesting. Transparency of the Martian atmosphere cannot be pinned down.

**Clyde FOSTER (CFs)**, after one week, communicated an L-colour and an IR685 at  $\omega=116^\circ\text{W}$ . The evening Solis L looks to locate under fine Martian sky, but Ophir is full of cloud, especially thick at the northern part. Olympus Mons is obvious on the morning side in a ring shape, but not particularly bright. The Tharsis ridges are barely seen on the IR image. The disk looks wholly dim, and so the both polar areas are not well detailed.

**Silvia KOWOLLIK (SKw)** just came back on stage after a long absence. She uses a 15cm Maksutov catadioptric telescope at Ludwigsburg. This colour image was obtained at  $\omega=168^\circ\text{W}$ . The cloudy Olympus Mons is on the evening side, and the light Elysium is visible bounded by Propontis I and Phlegra on the left-hand-side and the bluish Ætheria dark patch (just in the morning) on the right-hand-side. The area of the npc is a bit whitish light. The light and shade southern polar hood is vaguely visible above the dark zone made by M Sirenum and M Cimmerium.

**22 May 2016 ( $\lambda=156^\circ\text{Ls}$ ~ $157^\circ\text{Ls}$ ,  $\delta=18.4''$ ,  $\varphi=11^\circ\text{N}$ , at opposition at 11:11GMT)**

**EMr** obtained again a set of excellent images at  $\omega=240^\circ\text{W}$ ,  $\varphi=11^\circ\text{N}$  (04:16 GMT). On B and G, the cloud at Elysium Mons is extremely bright, but dim in R. In RGB the pinkish ground-lit streak at the west end of Elysium is quite obvious bounded by the l-h-s canal of the Ætheria dark patch. Note also that to the north of Propontis I there exists a thin cloud. The NW part of M Cimmerium is detailed together with Hesperia and M Tyrrhenum. Ausonia Australis is again well depicted (in R). The npc is definite but the SE-ward cloud projection is blurred. The description of the Elysium area is still interesting. The sph looks to have somewhat retreated.

**TWI** gave an IR807 image at  $\omega=252^\circ\text{W}$ . This proves typically any IR does not show the cap cloud (at Elysium Mons) and the sph.

**Is** lined up four images at  $\omega=357^\circ\text{W}$ ,  $006^\circ\text{W}$ ,  $017^\circ\text{W}$ ,  $026^\circ\text{W}$ . They show how the sph comes inside the disk, but there seems no objectives to be especially checked.

**Km** obtained a set of an L-colour image and B image at  $\omega=024^\circ\text{W}$ . The time was 14:05 GMT and hence it was about three hours later than the opposition time. Namely henceforward the following limb should be called the morning terminator. At Km's observation site in Osaka, the sky continued favourable, and this time also the area from S Meridiani to Oxus is tremendously detailed. Typical Aram Chaos and the Ods are of course obvious. However, due to the excessive procedure, some borders of the dark markings are strangely surrounded by the ghost-like bright fringes. One of the interesting points is that the inmost corner of the sph is quite shadowy. Is it because the oblique light does not fully reach? The area around of the npc is also dim despite the upcoming  $\phi$  tilt to  $11^\circ\text{N}$ . In these cases, the similar observations have to be continued to compare until after midnight. This image at  $\omega=024^\circ\text{W}$  suggests a presence of the morning mist and hence it was possible to chase the Tharsis ridges inside the morning mist within two hours.

**CFs** gave a couple of the L-colour images at  $\omega=111^\circ\text{W}$  and  $\omega=134^\circ\text{W}$  associated with IR images respectively. Both show the Olympus Mons ring clearly. At  $\omega=111^\circ\text{W}$ , the upper part of Candor shows an interesting mist patch which quite is developed near the terminator at  $\omega=134^\circ\text{W}$ . Any case like this should be chased every 20 minutes.

**23 May 2016 ( $\lambda=157^\circ\text{Ls}$ ,  $\delta=18.4''\sim 18.5''$ ,  $i=01^\circ$ )**

**EMr** produced another excellent RGB composite at  $\omega=221^\circ\text{W}$  based on the R, G, B ingredients. (EMr took also on the preceding days as follows:  $+\omega=240^\circ\text{W}$  on 22 May,  $+\omega=253^\circ\text{W}$  on 21 May,  $+\omega=265^\circ\text{W}$  on 20 May,  $+\omega=291^\circ\text{W}$  on 18 May). Here also the R image is excellent and shows well the fine structure of M Cimmerium and its neighbourhood. One particular aspect on the RGB disk is that Syrtis Mj near the morning terminator is *never* bluish and darker than expected. We know Syrtis Mj itself is never bluish, but just bluish seen through a thin (evening or morning) mist. Here, is it because of the absence of an enough mist? Or is it because this case occurred just after half a day from the opposition? That is, is it a kind of the opposition effect? (EMr missed the chance to image the surfaces a bit earlier.) It is true that the Martian season is approaching the northern autumnal period, and the water vapour supplied from the arctic area is decreasing, and hence the water-vapour shortage must have been caused around the equatorial zone already. Anyway it will be necessary to watch the activity of the water vapour up until  $\lambda=180^\circ\text{Ls}$  (at the beginning of July 2016). The present B image shows a narrow mist zone which crosses Syrtis Mj, but the RGB does not seem to reproduce this minor aspect. The cloud around the summit of Elysium Mons looks weaker than the case on the preceding day at  $\omega=240^\circ\text{W}$ . That is, this cloud is the one that will develop in the evening. There is a mist band at Cebrenia to the north of Propontis I, and another arctic mist is active to the south of the npc. As to the reason why Syrtis Mj is *not* bluish near the morning terminator, it will not be because of the opposition effect, since in 2014 on 14 April, the fact that Syrtis Mj was really bluish misty near the morning terminator was witnessed by several observers such as S BUDA, R KONNAĬ, B CURTIC, T ISHIBASHI, M VALIMBERTI, A WESLEY (for more details see N.B. below). On

14 April 2014, the phase angle was just  $\iota=05^\circ$  since the opposition occurred contiguously on 9 April. So the phenomenon is most probably due to the shortage of the water vapour.

**PGc** obtained a set of R, G, B and IR images and an R-RGB image at  $\omega=234^\circ\text{W}$ , where Syrtis Mj is near the morning terminator, but also not bluish. The inside of Utopia shows slight and shade patterns.

**TWI** gives an image at  $\omega=255^\circ\text{W}$  but unfortunately does not provide the B image at this important period.

**David WELDRAKE (DWd)** gave a set of images with a composite at  $\omega=354^\circ\text{W}$ . The sph is whitish as well as the npc, but the colour image looks dimmer in general.

**Ak** used a 40cm Cass at the Utsunomiya University Observatory to make a couple of the RGB image sets at  $\omega=356^\circ\text{W}$  and  $\omega=020^\circ\text{W}$  (+ B and IR images). The IR685 images show the Neudrus double canals, as well as the minor markings from Brangæna to Oxus including the Ods. The white matters around the peripheral limb of the disk look normally distributed.

**Km** obtained a usual set at  $\omega=028^\circ\text{W}$ . The L-colour image shows quite details, though the density of any marking looks coarser than usual (not pushed excessively). The area of Aram Chaos is nicely depicted. The Ods looks a bit brownish. The light and shade of the sph and the area of the npc are well shown.

**CFs** gave usual images at  $\omega=097^\circ\text{W}$ . The L-colour image appears dirty-looking whole over the disk including the npc and the sph. Is it because of the atmosphere? Olympus Mons is roundish doubled.

♂.....**Intermission N.B.2** : (Here would like to digress into the problem how the morning Syrtis Mj behaves at the opposition time.) There were considered at least two possibilities: One is that the opposition effect works, and the other we may consider that it's because of the shortage of the water vapour. So another of the present writers (Mk) tried to check the previously collected data, and reached the conclusion that, as far as within 10 days around the opposition day the bluish phenomenon remained recognisable. In 2001 and 2003, the ToUcam images provided a lot of low-resolution images, even then some of proved the blue Syrtis Mj beneath the thick morning mist:

	<i>Opposition</i>	<i>Images which shows the bluish misty Syrtis Mj</i>
2001	13 June ( $\lambda=177^\circ\text{Ls}$ )	nearly few but DPk18June01 proves.
2003	28 August ( $\lambda=250^\circ\text{Ls}$ )	DPk12Aug03, SBd14Aug03, Ak21Aug03, SBd22Aug03, Mo23Aug03, Ak25Aug03, ENg27Aug03, WTn27Aug03
2005	07 Nov. ( $\lambda=320^\circ\text{Ls}$ )	DPc27Oct05, JWn02Nov05, JPh04Nov05, KGr08Nov05 are affirmative even when the surface was dirty because of the dust disturbance at Eos (on 20 October).
2007	24 Dec. ( $\lambda=007^\circ\text{Ls}$ )	CPI18Dec07, CPI22/23Dec07, DPk30Dec07, WFI31Dec07
2010	29 January ( $\lambda=044^\circ\text{Ls}$ )	PGc17Jan10, DPk20Jan10, WFI22Jan10
2012	03 March ( $\lambda=078^\circ\text{Ls}$ )	Km20Feb12, SGh27Feb12, JWr01Mar12, JWr04Mar12, CPI05Mar12, DPC06Mar12 all affirmative.

We thus are led to the conclusion that the shortage of water vapour is a main reason since the

season is gradually going to reach  $\lambda=180^\circ\text{Ls}$ . **Now we resume the thread of our Report.**

**24 May 2016 ( $\lambda=157^\circ\text{Ls}\sim 158^\circ\text{Ls}$ ,  $\delta=18.5''$ )**

**EMr** made an RGB composite at  $\omega=208^\circ\text{W}$ . Syrtis Mj is surely visible quite near the morning terminator, while its shape and colour are not explicit on the RGB image. We hope to know the reason. In B the cloud at Elysium Mons looks much weaker than the case on 22 May (perhaps because it will grow gradually when approaching the evening). The pinkish ground-lit streak at the westernmost part of Elysium is most evident, and also some area at the southern flank of Elysium Mons is slightly pinkish. The pinkish ground-lit property of the streak is not necessarily dependent of the opposition effect, and this was familiar in 2014 (for example, refer to Bill FLANAGAN (WFI)'s image on 5 May 2014 ( $\lambda=126^\circ\text{Ls}$ ,  $\iota=21^\circ$ ) at  $\omega=254^\circ\text{W}$ ). Note also the cloud to the north of the check-type Propontis I and the arctic bright cloud associated with Olympia.

**MVI** made two sets of the RGB composites at  $\omega=344^\circ\text{W}$  and  $\omega=358^\circ\text{W}$ . The former shows the details of S Sabæus and S Meridiani in a moderate contrast. The latter is made slightly more contrasty and the area of S Meridiani to Oxus looks quite detailed. The expression of Aram Chaos is pretty and the Ods is quite definite. Both images are however weak to describe the npc and the sph. These suggest that the surface is covered by the airborne dusts which might have been caused by several minor dust disturbances possibly occur frequently after around  $\lambda=150^\circ\text{Ls}$ .

**Sbd** obtained a set of the RGB composite at  $\omega=351^\circ\text{W}$ . The R image well shows the details around every marking, especially those from S Meridiani to the north of Oxus. Aram Chaos looks nice and the expression of the Ods appears as if completely mastered. The RGB image gives us an impression that it is never full of contrast, and hence it gives us the impression that the surface is thinly covered by the airborne dusts (quite the same as the case of MVI). Otherwise, since the Astrodon B image shows the dark markings more clearly than usual (it was once called an opposition effect), it may be partially related with the "full-moon" state of the surface.

**MJs** obtained two sets of components at  $\omega=355^\circ\text{W}$  and at  $\omega=005^\circ\text{W}$  to compose a couple of excellent RGB composites. On the RGB image at  $\omega=355^\circ\text{W}$ , the whole area of Hellas looks rather plain shadowy, while 40 minutes later the gaseous of the sph turns down to the upper southern part of Hellas. The sph is not strong but looks whiter at  $\omega=005^\circ\text{W}$ . The details are satisfactory: Neudrus double canals, and the Ods are shown up. Aram Chaos is nicely shot. The tint of M Acidalium suggests a spread of airborne dusts. The morning mist following M Acidalium is rather thick.

**CFs** gave an L-colour image + IR685 image at  $\omega=101^\circ\text{W}$ . Solis L is located near the evening limb, but it's not easy to judge it is free from any mist. Olympus Mons is at the morning side.

**25 May 2016 ( $\lambda=158^\circ\text{Ls}$ ,  $\delta=18.5''$ )**

**Michael ROSOLINA (MRs)** gave a colour sketch at  $\omega=210^\circ\text{W}$ . M Cimberium is visible. Elysium is also maybe. The deserts look yellowish.

**Ak** at home made an RGB image at  $\omega=015^\circ\text{W}$  (+ B and IR685 images). The image looks coarser. The tint of the disk reminds us of Ak's colour. The sph is rather thin, light and shade.

**26 May 2016 ( $\lambda=158^\circ\text{Ls}$ - $159^\circ\text{Ls}$ ,  $\delta=18.5''$ - $18.6''$ )**

**John SUSSENBACH (JSb)**, from Holland, sent us a single RGB image at  $\omega=150^\circ\text{W}$ . Solis L is on the evening limb, and Elysium is very bright at dawn near the morning terminator. Olympus Mons is quite sombre. M Sirenum is apparent. The sph is thin.

**FMI** gave a single colour image at  $\omega=198^\circ\text{W}$ . Elysium is light just before the CM. The evening side is without any detail. The sph is a bit light and the area of the npc is roughly light. At a glance the surface looks not clean (due to the airborne dusts?).

**Mo** obtained a set of images  $\omega=007^\circ\text{W}$  including the RGB, LRGB, and so on. We are truly sorry for Yukio MORITA about the recent poor weather/seeing conditions. Looking at the Martian surface shown on the LRGB and RGB images, we feel discouraged because of the recent sombre colour. We would like to encounter with a much cleaner surface of Mars. However the muddy colour must be the reality. We should so endure and wait for another change of atmosphere. Shall we? Mo's R image caught a part of Brangæna, Indus, Oxus et al and so the LRGB shows all of fundamental elements.

**CFs** obtained an L-colour image and an IR image at  $\omega=079^\circ\text{W}$ . The colour looks muddy whole over the surface, while the Fortuna double ring, Tharsis Montes and Olympus Mons are caught. To the SW direction of the npc, there is seen a cloud patch. The sph looks widely divided, and a part is quite thick near at the area of Argyre.

**Robert SCHULZ (RSz)** contributed a colour image from Wien (first ever since 2008?) by using 20cm SCT and 224 MC camera. On the afternoon side, Solis L is dark and big together with Agathodæmon. Ophir is light free from any mist, but Xanthe looks quite misty near the preceding limb. Nilokeras remains inside the disk. The surrounding of the npc is whitish light. The sph looks also whitish. Tempe and Arcadia are a bit lighter. To catch Olympus Mons, the grains should be much finer.

**27 May 2016 ( $\lambda=159^\circ\text{Ls}$ ,  $\delta=18.6''$ ,  $\phi=12^\circ\text{N}$ )**

**PGc** issued a set of R-RGB images at  $\omega=193^\circ\text{W}$ ,  $\phi=12^\circ\text{N}$  and an IR685 image at  $\omega=196^\circ\text{W}$ . PGc's site is in Connecticut which is located between NY and Boston, and a bit northern than the line of  $40^\circ\text{N}$ , and naturally he complains about the low altitude of the planet. This time the images are not failed by the use of an ADC. M Cimberium is on the morning side, and Elysium is visible whose inside is light, following the dark Propontis I near the CM. Olympus Mons is white (especially in B) at the preceding limb. The west of Elysium is bounded by the Ætheria dark patch whose western side is dusty bright! The bluish white sph is nice (if through R-RGB). The IR image looks processed excessively.

**Tadashi ASADA (As)** took these images by remote controlling (Haleakala, Hawaii, the US  $\leftarrow \rightarrow$  His home at Munakata, Fukuoka Prefecture, Japan). The R image was taken at  $\omega=289^\circ\text{W}$ , and then sequentially G and B images. On R, Syrtis Mj is near the CM, but the image is not so sharp enough to show the

Baldet crater. The western dark end of Ausonia Australis is shown. An area at the southern limb (a bit declined eastwards) has a bright part in G and B. This is however bright also in R, and hence does it show a deposit frosty part?

**MVl** composed a couple of the RGB composites at  $\omega=302^\circ\text{W}$  and  $\omega=306^\circ\text{W}$  (IRs are at  $\omega=304^\circ\text{W}$  and  $\omega=308^\circ\text{W}$  respectively). On both of the RGB images, the sph looks thinner and blurred. Any marking at the latitude-level of Deucalionis R looks dusty hazy including the area of Iapygia Viridis. That the images are of high quality is apparent since the Huygens crater is very apparent (appears in cubic 3D) as well as the dark dot of the Baldet crater (which shares its caldera with the caldera of the Antoniadi crater). So we are sure the opaqueness of the atmosphere is due to the airborne dusts which are now thicker.

**SBd** also gave an excellent set of images at  $\omega=307^\circ\text{W}$  which derives us to the same conclusion as made at the above MVl column. The Huygens crater is now really three dimensional and the Baldet crater is quite edged, and hence the image set including the RGB is of very high of quality. And hence the lack of transparency has surely been caused by the global spread of the airborne dusts. The effect of the spread will soon give a temporal change of the climate. The npc is still definite though somewhat off-white, and the area of Utopia is haunted by weaker mist patches. The sph looks to be scattered and have become weaker in general.

**JWr** gave a set of three components and the RGB composite at  $\omega=099^\circ\text{W}$ . Solis L on the afternoon side is dark and its south is thickly bright as a part of the sph. Ophir is especially bright, but not so thick in B. The evening Xanthe is bright with the evening mist. Tempe is a bit lighter and Ceraunius is a bit shadowy. The area of the npc is light.

**28 May 2016 ( $\lambda=159^\circ\text{Ls}$ - $160^\circ\text{Ls}$ ,  $\delta=18.6^\circ$ )**

**Ak** used a telescope of the Utsunomiya University observatory to produce three sets of the RGB, B and IR images at  $\omega=307^\circ\text{W}$ ,  $\omega=321^\circ\text{W}$  and  $\omega=344^\circ\text{W}$ . The angle was obtained at  $\omega=344^\circ\text{W}$  was obtained at 23:58 JST and Mars passed the meridian in Japan at around at 23.5 h JST. As the RGB image, the one at  $\omega=321^\circ\text{W}$  is soft and the best in showing Syrtis Mj and S Sabæus. It is apparent that the seeing was poor, but we suspect that he must have had a hard time to face to the bad transparency condition of the Martian surface. At  $\omega=321^\circ\text{W}$ , the npc is definite, and a misty disturbed area exists near the npc. In IR, the area at Hellas looks very plain though Yaonis Fr is evident. The Huygens crater is apparent in IR.

**Og** obtained a single 290M colour image at  $\omega=327^\circ\text{W}$ . It appears that the processing is excessive. The dark markings should be accompanied by a soft gradation. The sph and the evening mist have to show a whitish nuance. It is also strange that the perimeters of such main markings as Syrtis Mj and S Sabæus look surrounded by strange light bordering. However the Neudrus double canals, the inside of the Huygens crater, and the Oxus dark segment (Ods) are nicely depicted. Unfortunately the Balde dark spot was not isolated.

**Km** gave an L-colour and the B image at  $\omega=346^\circ\text{W}$ . The contrast of the sublimated/dried Hellas and the thin northern end of the sph is nicely depicted. But the reason why a whitish border appears at

the northern boundary of S Sabæus is unknown. The morning mist at M Acidalium is visible. The npc is dull but definite.

**CFs** put forwards a couple of the L-colour images/IR images at  $\omega=057^\circ\text{W}$  and  $\omega=072^\circ\text{W}$ . The L-colour image is quite detailed but never beautiful at all. The whiteness is nowhere found. Even if the dusty aerosol is full, but is never global yet. The details around Tithonius L look enough, but as far as we (one of us, Mn) saw the Aurea Cherso area in 2003, the area showed us more sharpened aspect in the airborne dusty period. It is interesting to see a catch of a mist protrusion around the npc at  $\omega=072^\circ\text{W}$ , but the area around the npc is very off-whitish.

**Manos KARDASSIS (MKd)** is on the stage from Athens. His site is near  $38^\circ\text{N}$ , and so we are afraid that MKd is complaining about the low altitude of Mars. The RGB image by DMK was taken at  $\omega=075^\circ\text{W}$  and an IR685 image at  $\omega=079^\circ\text{W}$ . This colour image is, under the present situation, not colourful, but the sph shows a whitish aspect. The IR image looks somehow blurred, but it shows a potential capacity by detecting the double ring near Fortuna, the presence of Tharsis Montes, as well as Olympus Mons. However these are not reflected into the RGB.

**Luis FERNÁNDEZ (LFn)** sent us from Sevilla one 120MC colour image at  $\omega=113^\circ\text{W}$ . The colour of the image looks sombre, and the sph is not powerful. Ophir is however light, and looks not misty yet. Otherwise, the image shows an interesting cloud belt to the south of the npc.

**29 May 2016 ( $\lambda=160^\circ\text{Ls}$ ~ $161^\circ\text{Ls}$ ,  $\delta=18.6''$ )**

**PGc** lined up three set of RGB images taken at  $\omega=160^\circ\text{W}$ ,  $\omega=166^\circ\text{W}$ ,  $\omega=170^\circ\text{W}$ . The first two are accompanied by IR685 images. The image at  $\omega=170^\circ\text{W}$  shows well the whiteness concerning the sph and the evening cloud over Tharsis Montes. (Even then the yellowish arc line which is visible at the preceding limb is annoying.) On the B image at  $\omega=160^\circ\text{W}$ , the white clouds at Tharsis Montes and the one on Olympus Mons are clearly shot. The cloud at Arsia Mons is well large, and there is a gap by a shadowy line between Arsia Mons and Pavonis Mons. The Alba cloud is also visible. The morning part of the sph has a thick white part. On the other hand, Elysium on the morning side is not appealing at first, but lighter at  $\omega=170^\circ\text{W}$ . The lighter part inside of Elysium is closely co-related with the cloud patch to the north of Propontis I. This is whitish, but no whiteness appeared at least until  $\omega=170^\circ\text{W}$  inside Elysium. Note that M Sirenum is quite dark in every RGB.

**EMr** produced an RGB composite at  $\omega=176^\circ\text{W}$ . This is made just after PGc's observations, and shows similar characteristics checked in PGc's cases. First, the desert ground brownish colour is checked in both cases. Secondly, no white cloud is found inside Elysium. This will appear as Elysium will approach the evening limb. Thirdly, to the north of Propontis I there is seen a cloud patch which may be related with the material inside Elysium. On EMr's image, whitish bright is Olympia which was not so explicit on PGc's images. Olympia may be sending an ascending gaseous matter. Olympus Mons is beautiful with some white cloud at the eastern flank. Since still  $\tau=06^\circ$ , the annular ring of the lava plateau of Olympus Mons is shining. The white thick patch inside the sph which comes down to the eastern side of M Cimmerium is also impressive. Here some details of Mare Cimmerium and the Ætheria dark patch are

shown now. The clouds at the Tharsis ridges have been unified like a cloud streak as the ridges are now quite close to the evening limb.

**FMI** gave a single colour image at  $\omega=185^\circ\text{W}$ . This nicely shows the configuration of M Sirenum and M Cimmerium. The sph has a brighter part to the south of the eastern part of M Cimmerium. Elysium does not show yet the white part of Elysium. Olympus Mons must be near the evening limb.

**TWI** gave an IR807 image at  $\omega=196^\circ\text{W}$ . Some details of M Cimmerium are shown, and the split of the Ætheria dark patch. Propontis I is shown. To watch the cloud situation henceforth, additional shooting by the use of the B filter is indispensable.

**CFs** gave a set of L-colour and IR images at  $\omega=054^\circ\text{W}$ . The shape of the sph is somewhat different from the one at  $\omega=057^\circ\text{W}$  on the preceding day, but otherwise the present one is similar/inferior to the preceding  $\omega=057^\circ\text{W}$  image.

### 30 May 2016 ( $\lambda=161^\circ\text{Ls}$ , $\delta=18.6''$ )

**EMr** constructed an RGB composite at  $\omega=154^\circ\text{W}$ . Olympus Mons is located on the afternoon side showing a pinkish ring, and it just begins to receive a cloud attack from the eastern flank (the LMT of OM is at 1:50 h after the noon). At this angle, the Tharsis clouds are separately visible though Arsia Mons's cloud is weaker. Alba is small and whitish. Elysium has just come inside the disk, but some streak of a whitish matter is seen inside and goes down to the north of Propontis I. The npc region shows also several arctic white clouds around itself. The sph also shows a very thickly whitish part in it.

**Sbd's** RGB image was taken at  $\omega=267^\circ\text{W}$ . The southern dark markings and the northern Utopia look slightly hazed by aerosols, while the image itself is of the high quality showing several details around M Cimmerium (the Herschel crater is detailed) in addition to the northern district of Syrtis Mj (the dark spot of the Baldet crater). Even then the good-shaped sph keeps a bluish-white tint. Notable is the keen whiteness of the evening cloud over Elysium Mons which is in good contrast with the ground-lit pinkish streak of Elysium. The area around the npc shows some whitish or off-whitish misty matters.

**MJs** produced four RGB sets at  $\omega=284^\circ\text{W}$ ,  $\omega=293^\circ\text{W}$ ,  $\omega=304^\circ\text{W}$ ,  $\omega=315^\circ\text{W}$ , chasing the surface every 40 minutes. At first, Elysium was very whitish near the evening limb, and next it was shown on the limb, but finally it went to the rear side leaving a mist. From the outset, Syrtis Mj was near the CM, and the Huygens, Schröter, Balde craters remained explicit. At the latitude level of Deucalionis R, the brownish airborne dusts are spread along including the area over Iapygia Viridis. The southern part of Hellas still shows a whitish weak gaseous. Utopia also shows some light and shade brownish blurred areas inside which expand westwards. The nps is whitish stable. The sph is whitish thick to the ES of Hellas, but the denser part became weaker by the planet rotation. In B, a cloud belt is visible near at Dioscuria, and in R the description of the left-hand-side neighbour of Hellas attracts us.

**MVI** also gave a series of RGB images at  $\omega=287^\circ\text{W}$ ,  $\omega=293^\circ\text{W}$ ,  $\omega=297^\circ\text{W}$ ,  $\omega=303^\circ\text{W}$ . The details are stable, and the Baldet crater is visible in every image. The equatorial zone may be cleaner, but the large re-

gion to the south of the line 20°S looks dirty. The sph is not so whitish on the VMI description. Utopia is brownish, and the npc is good shaped but off-whitish.

**Km** obtained a set of L-colour and B images at  $\omega=316^\circ\text{W}$ . Some details of Pandoræ Fr, the fine 3D structure of the Huygens crater, the dark points associated with the Schröter crater and the Baldet crater are clearly given, though not so edged. Area of Noachis does not show the occurrence of the dust disturbance. Just we are anxious about the light brownish area (as an western extension of Utopia) to the south of the npc.

**31 May 2016 ( $\lambda=161^\circ\text{Ls}$ - $162^\circ\text{Ls}$ ,  $\delta=18.6''$ )**

**EMr** gave an RGB composite image at  $\omega=160^\circ\text{W}$ . Torio of the Tharsis clouds are more evident though Arsia Mons's cloud is singular. The ring of Olympus Mons is apparent ( $i=08^\circ$ ) with the jade-green central peak. The sph is shows a very white part to the south of M Sirenum. The place is not identical, however, with the bright part shown by PGc on 29 May at  $\omega=160^\circ\text{W}$ . Elysium is now inside of the disk, but not whitish, just connecting with a rather whitish mist to the north of Propontis I.

**JSb** showed a single RGB composite at  $\omega=062^\circ\text{W}$ . On the morning side of the southern hemisphere Solis L is dark, and near the evening limb, Meridiani S is a bit seen preceding Margaritifer S and Auroræ S. On the northern hemisphere M Acidalius is dark and vast near the evening limb. Its NW corner is darker. The image is less colourful, and the whiteness is not employed so that the sph and the npc are unknown.

♂.....**We Further Received** from Ak, MJs, Paul MAXON (PMx), Charles TRIANA (CTr) as follows:

**AKUTSU, Tomio (Ak)** at Cebu, the PHILIPPINS

17 RGB Colour +1 R+ 17 B + 16 IR Images (24, 25, 27,~ 30 April 2016)  
36cm SCT with an ASI 174MM

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

3 Sets of RGB Images (15 May 2016) 30cm Spec with a DMK21AU618

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

5 Sets of RGB + 5 IR + 1 CH4 + 1 UV Images (10, 11, 12, 13, 15 May 2016)  
25cm Dall-Kirkham with an ASI290MM

**TRIANA, Charles (CTr)** Bogota, COLOMBIA

1 Set of LRGB Image (10 April 2016) 25cm SCT @f/27 with an ASI120MM

♂.....We shall continue here to review the above observations chronologically:

**10 April ( $\lambda=135^\circ\text{Ls}$ ,  $\delta=13.1''$ )** : **Charles TRIANA (CTr)** obtained an LRGB image at  $\omega=306^\circ\text{W}$ ,  $\phi=6^\circ\text{N}$ . Hellas is still blue-whitish near the evening limb. The evening mist reaches Syrtis Mj which partly shows a bluish tint. S Meridiani is still near the morning limb. The morning mist is thick. The npc is unknown.

**24 April ( $\lambda=142^\circ\text{Ls}$ ,  $\delta=15.1''$ )**: **Tomio AKUTSU (Ak)**'s observations were all made in the Philippines. The images on this day were once treated in CMO n°447 Ser3-1101, but after his return he reprocessed, and so we include them here. On 24 April Ak obtained two sets of RGB images at  $\omega=288^\circ\text{W}$ ,  $\omega=320^\circ\text{W}$ .

The former shows that the frost inside of Hellas is weaker at the western corner, while the latter does that Hellas is full of frost upto Yaonis Fr. On the latter, the evening mist is over Syrtis Mj and makes the area bluish.

**25 April ( $\lambda=143^\circ\text{Ls}$ ): Ak** obtained a four series of images at  $\omega=291^\circ\text{W}$ ,  $\omega=301^\circ\text{W}$ ,  $\omega=323^\circ\text{W}$ ,  $\omega=332^\circ\text{W}$ . The image of  $\omega=291^\circ\text{W}$  might have been in a better seeing, the Baldet crater looks caught. The frost inside Hellas is thick on the eastern half, while off-white on the other side. Same at  $\omega=301^\circ\text{W}$ , while at  $\omega=323^\circ\text{W}$ , Yaonis Fr is vivid and the gaseous reaches the western wall. On the morning side the Ods is visible. Note that near the evening limb a shape of cloud makes and it's explicit on the northern part of Syrtis Mj. Already the Noachis part near Deucalionis R looks airborne dusty. The npc is definite on every image.

**27 April ( $\lambda=144^\circ\text{Ls}$ ): Ak** gave a set at  $\omega=260^\circ\text{W}$ . The brightest part is at the western side of Hellas. The white cloud at Elysium is the brightest in contrast with the pinkish streak.

**28 April ( $\lambda=144^\circ\text{Ls}$ ): Ak** made three sets of RGB composites at  $\omega=275^\circ\text{W}$ ,  $281^\circ\text{W}$ ,  $284^\circ\text{W}$ . The first two are rough, while the last at  $284^\circ\text{W}$  may be better. The frost inside Hellas is up to the western wall.

**29 April ( $\lambda=145^\circ\text{Ls}$ ,  $\delta=15.9''$ ): Ak** lined up four RGB images at  $\omega=256^\circ\text{W}$ ,  $\omega=267^\circ\text{W}$ ,  $\omega=280^\circ\text{W}$ ,  $\omega=299^\circ\text{W}$ . At  $\omega=256^\circ\text{W}$ , the NW part of M Cimberium is well visible and the Herschel crater makes a shape. The northern border of Ausonia Australis is definite. The white cloud in Elysium is thick and sends its tail curved to the SE direction. Hellas is now faced to the morning side, and the brightest part of the frost at the SW part flows out westwards. The second and third images show the Baldet crater. At  $\omega=280^\circ\text{W}$ , a thin equatorial mist is visible from the evening side and straddles Syrtis Major and goes to the desert region. At  $\omega=299^\circ\text{W}$ , in addition to the cloud at Crocea, there are seen several mist patches near the Antoniadi crater and goes to the Arab desert region (second branch). This is an interesting set of images. The brightest area of the sph is at the SE corner of or outside Hellas, and looks as if it spread its wings to W and E. The west part goes down to the east of Yaonis Fr. Note Utopia shows some mists.

**30 April ( $\lambda=145^\circ\text{Ls}$ ,  $\delta=16.1''$ ): Ak** produced four image sets at  $\omega=230^\circ\text{W}$ ,  $\omega=240^\circ\text{W}$ ,  $\omega=249^\circ\text{W}$ ,  $\omega=280^\circ\text{W}$ . At  $\omega=230^\circ\text{W}$ , M Cimberium is detailed. Syrtis Mj is slightly separated from the morning limb, but the northern district is densely bluish, and it is connected with Elysium by a thin mist band. The ruins of the former Trinacria (Ausonia Borealis) are well suspected. The Ætheria dark patch is split to two canals. The area around must be governed by ghosts. The white cloud in Elysium is interesting at  $\omega=240^\circ\text{W}$ .

**10 May ( $\lambda=150^\circ\text{Ls}$ ,  $\delta=17.3''$ ): Paul MAXON (PMx)** issued a set of the R, G, B components to compose an RGB image (+IR685) at  $\omega=039^\circ\text{W}$ ,  $\phi=8^\circ\text{N}$ . PMx makes use of a 25 cm Meulon equipped with ASI 290MM. The beauty of this image set is that the area of Mare Erythræum or its north looks faded or dusty in a good light and shade. The soft gradation has been not found on other images we received, and so we feel this set is precious. The northern part of Margaritifer S and S Meridiani are quite detailed and well dark. Furthermore, this RGB shows a bright spot near/on the evening terminator, maybe related with the one at Eden.

**11 May ( $\lambda=151^\circ\text{Ls}$ ,  $\delta=17.4''$ ):** PMx obtained a RGB composite at  $\omega=026^\circ\text{W}$  and otherwise IR685 at  $\omega=027^\circ\text{W}$ , UV at  $\omega=029^\circ\text{W}$ , and CH4 at  $\omega=031^\circ\text{W}$ . That is, PMx chased the area in question by the use of IR, UV and CH4. The region is still irregular, but might have been somewhat averaged. We are now inquiring Dr Tadashi ASADA what kind of effect is possible to be revealed by the use of the CH4 filter on the Martian surface. We like this CH4 image which looks better than the R image.

**12 May ( $\lambda=151^\circ\text{Ls}$ ,  $\delta=17.5''$ ):** PMx gave a set of the RGB image and the IR685 image at  $\omega=012^\circ\text{W}$  and  $\omega=016^\circ\text{W}$  respectively. The area in question looks still faded. Does it show a traces of rampaging of devil storms? We would like to look for some images of the MRO. The IR image is slightly excessive, but Neudrus double canals, Brangæna, and the Oxus dark segment (Ods) are all apparent

**13 May ( $\lambda=152^\circ\text{Ls}$ ,  $\delta=17.6''$ ):** PMx gave a RGB set at  $\omega=001^\circ\text{W}$ ,  $\varphi=9^\circ\text{N}$ . Also IR685 image at  $\omega=005^\circ\text{W}$ . In IR, the Ods is evident. The area between Oxus and M Acidalium is light in B. In RGB Syrtis Mj pushes the evening mist near the limb. The R image is also well processed.

**15 May ( $\lambda=153^\circ\text{Ls}$ ,  $\delta=17.5''$ ):** PMx gave an RGB image at  $\omega=347^\circ\text{W}$  with original R, G, B and IR images at  $\omega=348^\circ\text{W}$ . The RGB is a good mild image; the gradation at the buried Mare Serpentis is attractive. The north of Oxus is occupied by a mist band. The Ods is evident.

On the same day, **Mark JUSTICE (MJs)** produced three RGB composites every forty minutes at  $\omega=097^\circ\text{W}$ ,  $\omega=106^\circ\text{W}$ ,  $\omega=115^\circ\text{W}$  ( $\varphi=9^\circ\text{N}$ ). At  $\omega=098^\circ\text{W}$ , the main part of the sph declined to the evening side. Solis L is dark free from the mist and the area around Aurea Cherso is well described. Auroræ S is misty, and its preceding area is thickly misty. The evening Tempe is also misty and a mist branch is extended up to Ascræus Mons. The Fortuna double ring is visible to the north of Tithonius L. The area of the Tharsis ridges is not clear, but Olympus Mons' plateau is lit in a shape of ring ( $\iota=06^\circ$ ). The npc is definite in shape and shows to its south some frost or cloud small patches. At  $\omega=106^\circ\text{W}$ , the mist over Auroræ S extends to Ophir-Candor. Solis L looks still free from the mist. Tempe's mist seems to make itself a patch. To the west of Juventæ F and its north, mist is concentrated. This configuration keeps until  $\omega=115^\circ\text{W}$ . The annular shape of Olympus Mons is clear and did not so changed.

*Masatsugu MINAMI and Masami MURAKAMI*

## *Letters to the Editor*

●.....*Subject: Mars 15th May 2016*  
*Received: 17 May 2016 at 21:37 JST*

Here are some images of Mars from the 15th May. Autostakkert did an amazing job of choosing & aligning the best frames considering the strength of the jetstream during imaging. Looks like quite a misty day on Mars.. An animation will follow shortly.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160515/MV115May16.jpg>

○.....*Subject: animation 1226 to 1312UT Mars 15 May 2016*  
*Received: 17 May 2016 at 22:14 JST*

Attached is a small animation of Mars' rotation from 1226UT to 1312UT on 15th May 2016.

○.....*Subject: Mars animation 20th May 2016*  
*Received: 22 May 2016 at 11:42 JST*

Please find attached an animation of Mars' rotation from 1046UT to 1401UT on the 20th May 2016. I have compressed the file as much as possible without affecting the data too much, but it is still rather large -

my apologies. Details were not very good early on due to Mars' low altitude, but improved later when higher in the sky. Seeing was generally very good. An image containing some of the frames used will follow soon. Best wishes

○.....*Subject: Mars Images 20th May 2016*  
*Received: 22 May 2016 at 18:14 JST*

Here is a composite of some of the images taken on the 20th May 2016. Best wishes

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160520/MVI20May16.jpg>

○.....*Subject: RE: Mars animation 20th May 2016*  
*Received: 22 May 2016 at 21:54 JST*

Dear Mr Minami & Mr Murakami, Thank you for your kind message. It is a great honour to have my latest Mars animaton on the CMO Façade - I am very grateful. Wishing you, and all at the ISMO clear skies & good seeing.

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On Sun, 22 May 2016 19:56:40 +0900, Masatsugu Minami wrote:

Dear Maurice, Thank you very much for your continuous contributions to our CMO/ISMO. Especially we are pleased to know you returned to your traditional procedure since May. Just this time we hope you would kindly pardon us if we try to lay out largely your recent marvelous animation of the Mars rotation, which you have elaborated on 20 May, on our CMO Façade as <http://www.mars.dti.ne.jp/~cmo/ISMO.html>

We look forward to your further activity on the Mars observations even after opposition. With best wishes,

Masatsugu MINAMI, [vzv03210@nifty.com](mailto:vzv03210@nifty.com)  
Masami MURAKAMI, [cmo@mars.dti.ne.jp](mailto:cmo@mars.dti.ne.jp)

○.....*Subject: Mars Images 27th May 2016*  
*Received: 28 May 2016 at 17:25 JST*

Attached is a composite of Mars images taken on the 27th May in fair seeing. Note the small elongated streak in Utopia running N to S near the evening terminator. It appears barely visible in R, brightest in G & somewhat visible in B images. Evening cloud perhaps? Kind regards

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160527/MVI27May16.jpg>

○.....*Subject: Mars 30th May*  
*Received: 31 May 2016 at 00:38 JST*

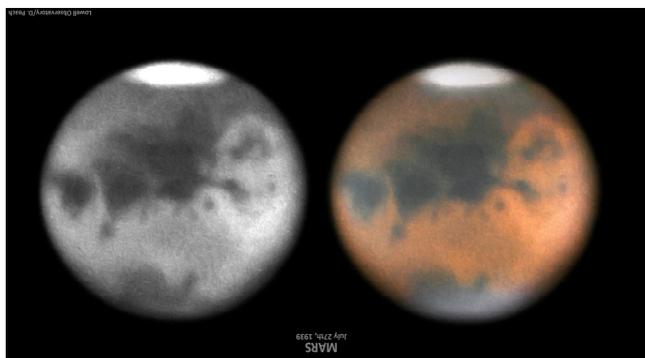
I have attached a quick animation of Mars from 1300 to 1323 UT on the 30th May. A hazy/yellowish looking Hellas & reddish area surrounding northern latitudes. Seeing was quite good. Images to follow in the next

day. Best wishes

**Maurice VALIMBERTI** (Melbourne, AUSTRALIA)

●.....*Subject: Some old views of Mars*  
*Received: 18 May 2016 at 02:01 JST*

Hi all, Here are some old Mars photo's reworked with modern techniques. I am sure many of these images were never in colour before now. I derotated various photo sequences together taken on certain nights to give a colour R(G)B image. For the Oct 8th 1941 result i de-rotated several R filter photos together for the result which is a significant improvement over the original single photographs.



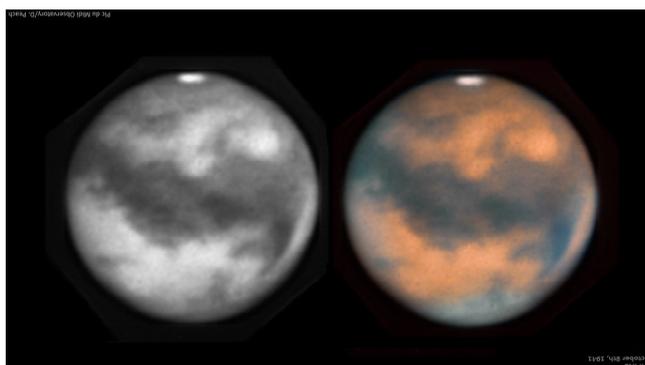
July 27th, 1939:

[http://www.damianpeach.com/marsold/mars\\_1939\\_lowell.jpg](http://www.damianpeach.com/marsold/mars_1939_lowell.jpg)



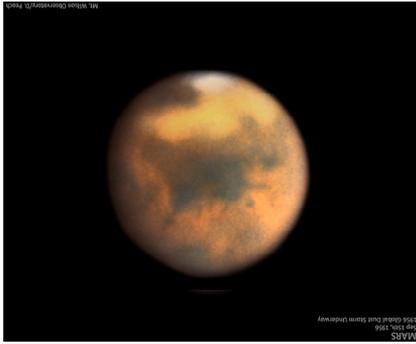
Sep 17th, 1941:

[http://www.damianpeach.com/marsold/mars1941sep17\\_pic.jpg](http://www.damianpeach.com/marsold/mars1941sep17_pic.jpg)



Oct 8th, 1941:

[http://www.damianpeach.com/marsold/mars1941oct08\\_pic.jpg](http://www.damianpeach.com/marsold/mars1941oct08_pic.jpg)



Sept 15th, 1956:

[http://www.damianpeach.com/marsold/mars1956sep15\\_mwo.jpg](http://www.damianpeach.com/marsold/mars1956sep15_mwo.jpg)

Best Wishes

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

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

●.....*Subject: Mars Images - May 9 & 12*

*Received: 18 May 2016 at 10:12 JST*

Gentlemen, Here are a few recent Mars images. The quality is not very good due to the low (27 degree) elevation. However, I hope there is some useful information for you to use in your analysis. Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160509/PGc09May16.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160512/PGc12May16.jpg>

○.....*Subject: Mars image - May 20*

*Received: 23 May 2016 at 11:17 JST*

Gentlemen, This is probably my best image so far this season. Imaging Mars at a 27 degree elevation is quite a challenge. Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160520/PGc20May16.jpg>

○.....*Subject: Mars image - May 27*

*Received: 29 May 2016 at 00:50 JST*

Gentlemen, This set of images was captured at an elevation of 27 degrees. Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160527/PGc27May16.jpg>

○.....*Subject: Mars image - May 23*

*Received: 29 May 2016 at 05:54 JST*

Gentlemen, Here is a set of images from May 23.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160523/PGc23May16.jpg>

○.....*Subject: Mars image - May 29*

*Received: 30 May 2016 at 13:44 JST*

Gentlemen, Finally, a decent set of images. Imaging Mars in northern latitudes has been a real challenge during this apparition. Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160529/PGc29May16.jpg>

**Peter GORCZYNSKI** (Oxford, CT)

●.....*Subject: Mars: May 17, 2016*

*Received: 18 May 2016 at 13:18 JST*

Hi, I have attached my latest image of Mars May 17, 2016 at 4:51 UT. The seeing was so bad that I didn't know why I went ahead to image Mars during that moment. It came out ok but not great.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160517/FMI17May16.jpg>

○.....*Subject: Mars: May 20, 2016*

*Received: 23 May 2016 at 00:52 JST*

Hi, I have attached my image of Mars May 20, 2016 at 5:54 UT. Thanks,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160520/FMI20May16.jpg>

○.....*Subject: Mars: May 21, 2016*

*Received: 27 May 2016 at 10:46 JST*

Hi, I have attached my image of Mars May 21, 2016 at 3:56 UT. Thanks,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160521/FMI21May16.jpg>

○.....*Subject: Mars: May 26, 2016*

*Received: 27 May 2016 at 10:47 JST*

Hi, I have attached my latest image of Mars May 26, 2016 at 3:50 UT. Thanks,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160526/FMI26May16.jpg>

○.....*Subject: Mars: May 29, 2016*

*Received: 30 May 2016 at 00:39 JST*

Hi, I have attached my latest image of Mars May 29, 2016 at 4:43 UT. Thanks,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160529/FMI29May16.jpg>

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

●.....*Subject: Mars, May 17*

*Received: 18 May 2016 at 14:32 JST*

Hi all, some excellent stable seeing this morning, here is an image of Mars showing Olympus Mons rising at left with the Tharsis volcanoes prominent to it's right. They are all cloud free in this image. The north polar remnant is visible at top left, and the south polar hood at bottom right with lots of cloud and what appears to be lines of ground frost or fog. The long horizontal fracture of Valles Marineris can be see at right of centre. There are some scattered clouds across the disk. This image is a single RGB composite, 90s per channel using a PGR GS3-U3-32S4M camera.

<http://www.acquerra.com.au/astro/gallery/mars/20160517-154936/m20160517-154936utc.png>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160517/AWs17May16.jpg>

**Anthony WESLEY** (NSW, AUSTRALIA)

●.....*Subject: Re: Some old views of Mars*  
*Received: 19 May 2016 at 02:38 JST*

Dear Damian, Some very nice work here. Of course, these are similar source materials to the images that Johan Warell and I had digitally composited in colour for the first time (and indeed derotated) for our paper three years ago in the BAA Journal (volume 123 part 3 pages 137-142 (2013)). We used images from 1941 to 1956. There is certainly scope for further work in this field as you have shown here. In our case we were sent copies of the scanned film originals. There must be many more sources of this sort of material, particularly if one were to be content with R(G)B type composites. The late Dr Dollfus used the method to get some less grainy Jupiter photos from the 1890s. Slipher's tricolour work goes back many decades, yet he rarely made colour composites himself, owing no doubt to the large amount of labour needed at that time: if I recall correctly he only published composites in colour of his Mars images from the 1954 opposition. Slipher's best Mars images are from 1939 and 1954, both occasions where he travelled south. Good wishes

○.....*Subject: Mars dust storm alert*  
*Received: 26 May 2016 at 18:55 JST*

#### BAA MARS SECTION DUST STORM ALERT

2016 May 26

Dear Observers: Images taken by Efrain Morales Rivera (Puerto Rico) in the last few days (May 21-24) clearly show a changeable bright yellow streak of dust at the IAU western (following) edge of Eysium. The bright cloud was very conspicuous in red light and was not related to the usual orographic cloud activity over Elysium Mons. The Director had observed the area on May 16 without seeing the storm, while on May 23 the Elysium region was too near the morning terminator for the correct longitude to have been visible to him. Evidence for previous telescopic dust storms in this area exists, but such events are very uncommon for Elysium, and sometimes the area has simply been a secondary focus of activity for another dust storm developing elsewhere, such as at the start of the 2001 planet-encircling storm. If you are able to do so, please monitor the area and send me your re-

ports. Secondary activity could occur elsewhere at any time now, though an image by Clyde Foster centred at longitude 101 degrees on May 24 shows that hemisphere to be free of dust. Best wishes,

**Richard McKIM** (Peterborough, The UK)

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**(Editor's Note):** As to the BAA Alert on 26 May 2016, Reiichi KONNAI readily sent us (on 27 May 2016 at 00:24 JST) a complaint about the misunderstanding on the ground-lit pinkish streak inside Elysium so that we shall reproduce here a correspondence made *four years ago* between R KONNAI and Ch PELLIER at the CMO Web LtE Site:

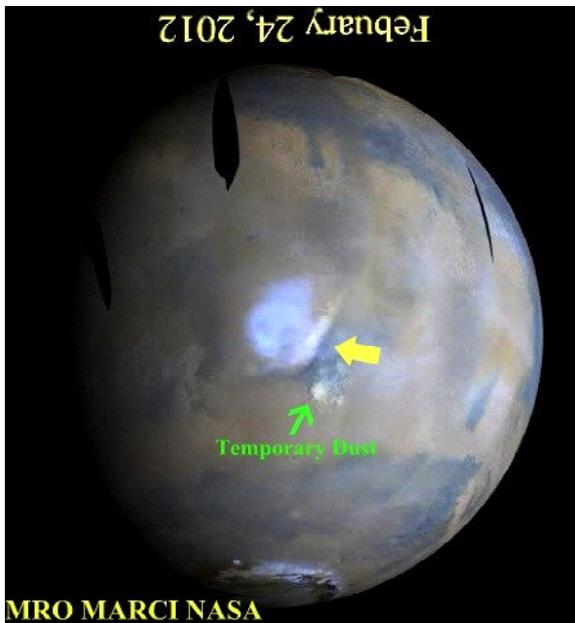
[http://www.kwasan.kyoto-u.ac.jp/~cmo/cmo/ISMO\\_LtE396.htm](http://www.kwasan.kyoto-u.ac.jp/~cmo/cmo/ISMO_LtE396.htm)

●.....*Subject: A kind of opposition effect?*  
*Received: Tue 06 Mar 2012 22:35 JST*

Dear Christophe, Your complete set of RGB, R, G, B, IR, V and UV images is always very informative. And your RGBs are impressive, most natural...they look exactly like what I see with my 30cm SCT...I believe your sense of color balance to be an expression of your "DNA of Visual Observer".

On your RGB image on 04 Mar 2012 23:30GMT  $\omega=229^\circ$   $\iota=03^\circ$  "the summit cloud of Elysium Mons" is clearly shown as an well isolated bright whitish spot; it deserves to be called "white cloud" as it is explicit even on IR as well as on R, G and B. I also noticed on the RGB image, fairly strong reddish tint of the diagonal elongated bright patch just off to the west of EM summit cloud, which looks like a distant candle flame blowing westward. Similar tints are also seen on other imagers' images as MLw's on 01 Mar 23:52 GMT, MDC's on the same day 23:43 GMT, PEd's on the same night 22:56 GMT, as well as on yours on 02 Mar 23:28 GMT and on 29 Feb (EM summit cloud seems thinner on 29th, inconspicuous on IR), etc. MLw commented in his LtE on 06 Mar as "Interesting colour variations in the Elysium cloud...". But I think the elongated diagonal reddish bright patch was not a cloud but an albedo feature, because on your 04 Mar image set it is bright on R and IR, dimmer on G and seems inconspicuous on B. Its location and shape sug-

gest it to be the lighter area adjoining inside the northwestern side of the classical pentagonal Elysium which has been conspicuous in this Apparition (see attached MRO MARCI image, the yellow arrow).



But what on Mars was the color? Was it a kind of the opposition effect? Or just my illusion?

Good Seeing and Transparency!

○.....Subject: PS

Received: Tue 06 Mar 2012 23:34 JST

I rechecked your three image sets mentioned above: EM summit cloud is very dense with a definite core on the B on 29 Feb, while rather vague on the Bs on 02 and 04 Mar. So, is it possible that on each of the latter dates the Bright Elysium was seen through a thin layer of misty matter? Best Regards

**Reiichi KONNAI** (Fukushima, JAPAN)

●.....Subject: Re: A kind of opposition effect?

Received: Wed 07 Mar 2012 07:31 JST

Dear Reiichi, Thanks for your comments on the colors of my RGB. This is not only because of my "DNA of visual observer" as you say. As an analyst, I just believe that the interpretation of color images is always facilitated if the processing keeps a "natural" or "realistic" aspect. Otherwise the data is less reliable.

I did not even notice that bright reddish patch next to Elysium! I have been looking for data and found the sofRosetta image in joint file to this color, and the e-mail : it is a ground albedo feature, reddish in

MOLA data shows that the shape is like that because this is the western flank of the Elysium slope...

So your color analysis of images was just right: we do see it bright (and very bright) in IR and R so the red color is implied (SBd image from feb. 23 is also very nice).

The existence of an opposition effect looks also fine to me. This would explain how bright is Elysium currently in near IR while the orographic cloud is not supposed to be visible in this band!

Re: PS: I do not think however that we see the Bright Elysium in the sense that we wrote in CMO 388: the summit is much too small for my spatial resolution, and much too covered by clouds currently. But, the whole extended mountain looks bright, yes definitely...

Best wishes,

**Christophe PELLIER** (Nantes, FRANCE)

●.....Subject: Mars 5 May 2016

Received: 19 May 2016 at 14:15 JST

Dear Richard and Masami, Sending you here a Mars image from May 5, the best one I have yet acquired this season. It is nothing to write home about and should of course not be compared to what others are getting this year, as the elevation and observing conditions are exceptionally difficult. But at least there's some very recognizable surface details, a bright Hellas and a southerly SPH (?) skirting the slightly off-pole position is visible. Mars was only at 12 degrees altitude and the seeing was a horrible, fast undulating 2/10. An ADC combined with individual processing of each color channel brought out what was there. Hoping to get another couples of chance with Mars before this apparition is past, bright summer skies are approaching fast. With best wishes,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160505/JWr05May16.jpg>

○.....Subject: Re: Some old views of Mars

Received: 19 May 2016 at 14:22 JST

Hi Damian, Very nice work! these old images are really brought to new life, with lots of small and faint detail better delineated. As Richard mentioned we did a similar exercise a few years back with similar results. It would thus be interesting if you could provide some more information about the original pho-

tographer, emulsion and instrumentation details, etc. What is the source of the original photos? Great to see you at the Juno workshop! Best wishes,

○.....*Subject: Mars, 20 May 2016*  
*Received: 24 May 2016 at 06:48 JST*

Dear Richard and Masatsugu, I captured Mars again last Friday night at 12 degree altitude under somewhat better conditions than May 5. On this low-contrast hemisphere, there was no surface detail visible on the computer screen when the avi's were recorded, and visually only the northern albedo features were seen. Good color balance was difficult to achieve on the final image which is slightly too yellowish. Olympus Mons near the evening limb and Elysium near the morning limb are somewhat bright, morning and evening hazes readily apparent. Best

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160520/JWr20May16.jpg>

**Johan WARELL** (Skurup, SWEDEN)

●.....*Subject: Mars Observation (May 13, 2016)*  
*Received: 19 May 2016 at 21:29 JST*

Dear Minami-san, I hope that you and the rest of the OAA Mars Section are doing well. I made an observation of the planet Mars on May 13, 2016 (Mars May 13, 2016 (04:45 U.T.), CM 326.5°W, Ls 152°(Late Northern Summer/Southern Winter), De 8.7°, Ds 11.6°, p 100%, 17.6 arc-seconds) singly 9-inch (23-cm ) F/13.5 Maksutov-Cassegrain at 282x/352x (Explore Scientific 82° eyepieces, excellent for sharpness and contrast) under good seeing (6-7/10) conditions. The planet presented a wealth of detail as indicated in my observation. The most prominent albedo features visible were Sinus Sabers/Sinus Meridiani (3/10) on the central meridian (CM) towards the south and Syrtis Major (3-4/10) and partially obscured by clouds) towards the eastern (evening) limb. The North Polar Cap (NPC) was obscured by clouds as well. The second image shows the major albedo features detected during my observation. The best of luck. Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160513/CHr13May16.jpg>

**Carlos HERNANDEZ** (Miami, FL)

●.....*Subject: RE: Mars IR700nm*  
*Received: 19 May 2016 at 18:33 JST*

Hi, please let me know if these are acceptable.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160518/PM118May16.jpg>

**Phil MILES** (Rubyvale, QLD, AUSTRALIA)

●.....*Subject: Mars 19, 2016*  
*Received: 20 May 2016 at 07:08 JST*

Date: May 19, 2016, Time: 05:51 GMT, CM: 290°, Ls: 155°

Telescope: 28 CM SCT, Camera: ASI 120MC, Filter +IR 807

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160519/TW119May16.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160522/TW122May16.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160523/TW123May16.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160529/TW129May16.jpg>

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

●.....*Subject: Mars - May 13th, 18th*  
*Received: 20 May 2016 at 12:47 JST*

Hi Mr. Minami and All!, Here I submit my sessions from May 13th, 18th.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160513/EMr13May16.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160518/EMr18May16.jpg>

○.....*Subject: Mars - May 21,22,23,24th*  
*Received: 26 May 2016 at 11:16 JST*

Hi Mr. Minami and All!, Here are my most recent sessions of mars under variable conditions.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160521/EMr21May16.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160522/EMr22May16.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160523/EMr23May16.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160524/EMr24May16.jpg>

○.....*Subject: Mars - May 20th, 29th*  
*Received: 31 May 2016 at 08:52 JST*

Hi Mr. Minami and All!, Here is my latest and one that I missed from my last post.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160529/EMr29May16.jpg>

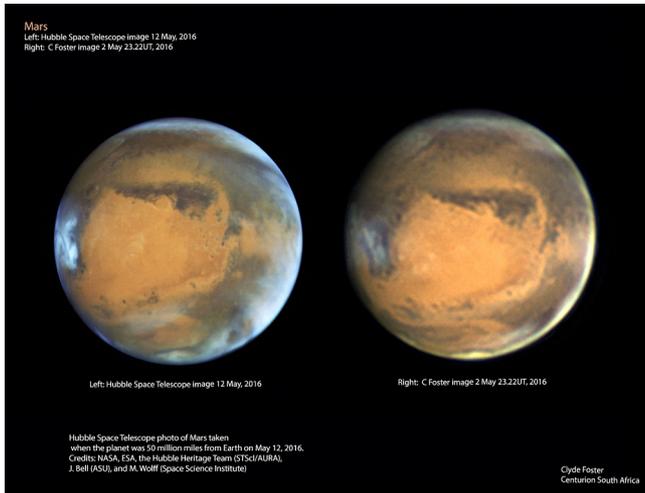
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160520/EMr20May16.jpg>

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

●.....*Subject: Hubble comparison*  
*Received: 20 May 2016 at 23:06 JST*

Hi all, Just to confirm that I have not lost my interest in Mars imaging! I have been reaching a new level of frustration this last week with rain, cloud and what I can only refer to as diabolical seeing conditions when there have been gaps in the cloud. I spent a few hours

around midnight last night and am hoping I can get something reasonable. Am busy working on the processing. In the meantime, I have done a comparison of the new Hubble image with the closest I could get, with one of my better images of the apparition, albeit 10 days prior to the Hubble image, so cloud detail is not comparable. Best,



○...**Subject: Mars 2016/05/21 19.50UT**  
**Received: 22 May 2016 at 20:59 JST**

Hi all, As noted in my last email, it has been a real battle to try and get anything decent over the last week with the weather and seeing conditions. I did get a bit of a gap last night before the clouds came in and attach the images. I am still going to try and get something out of the data I have collected over the last week, but due to the poor quality may submit as per this format (an L and IR image, or even just IR). If things improve, I will resort to either RGB or decomposing the L image again. Enjoy the Opposition nonetheless! Best regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160521/CFs21May16.jpg>

○...**Subject: Mars 2016/05/22 20:02 and 21:39UT**  
**Received: 23 May 2016 at 20:07 JST**

Hi all, I at last managed to have a longer session yesterday evening, although conditions were variable. I attach two image sets. Best regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160522/CFs22May16.jpg>

○...**Subject: Mars 2016/05/23 19:42UT CM97**  
**Received: 24 May 2016 at 16:58 JST**

Hi all, A capture from yesterday evening. It was a bit earlier in the evening, so Mars was not a greatest elevation. Average seeing conditions. Best,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160523/CFs23May16.jpg>

○...**Subject: Mars 2016/05/24 20:34UT CM101**  
**Received: 25 May 2016 at 15:27 JST**

Hi all, Mars yesterday evening. Average/below average seeing conditions and we have the jetstream extending above South Africa at present. Best,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160524/CFs24May16.jpg>

○...**Subject: Mars 2016/05/26 20:17UT CM79**  
**Received: 27 May 2016 at 19:53 JST**

Hi all, Mars yesterday evening. Seeing conditions were very poor, and this was the best of a bad bunch of attempted captures. It looks like there is an interesting structure to the SPH/SPC(?), although I would be wary of interpretation of detail under these conditions. Best,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160526/CFs26May16.jpg>

○...**Subject: Mars 2016/05/28 CM57 CM72**  
**Received: 29 May 2016 at 17:27 JST**

Hi all, Two captures of Mars from yesterday evening. Seeing conditions were still poor, but certainly improved from the previous few evenings. I am not sure if I have noted the hook like feature at the NPC before, extending south and then to the east. The bright spot, particularly in red, immediately on the north side of Valles Marineris also caught my attention. It was an evening spent between the observatory and the TV, with the Champions League final on. Thank goodness for PVR- I didn't miss any of the action, albeit a bit delayed! Best,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160528/CFs28May16.jpg>

○...**Subject: Mars 2016/05/29 20:24UT CM54**  
**Received: 30 May 2016 at 16:06 JST**

Hi all, Mars yesterday evening under average seeing. I will be away from home until next Sunday, so regrettably will not be capturing or posting until I get back. A bit of a family get away to the mountains, so not complaining! Enjoy your week. Best,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160529/CFs29May16.jpg>

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

●...**Subject: Three RGB Mars on 20th May 2016**  
**Received: 21 May 2016 at 17:06 JST**

Dear Mr. Minami and Mr. Murakami, I hope all is going well. Please find attached data for three RGB images of Mars as taken last night here in Bungendore. The seeing

was excellent, hence I continued imaging and ended up with three. I have attached separately the R, G, B and RGB images and there is also a details textfile with times and image data. If you need any more information please let me know. As the seeing was excellent there was a great deal of detail visible, Sinus Meridiani was on the meridian, and Syrtis Major was setting, Mare Acidalium was rising. Mars was very impressive through the eyepiece too. I hope you find the attached images useful. Thank you and all the best,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160520/DWd20May16.jpg>

○.....*Subject: RGB Mars Observation 23rd May 2016*  
*Received: 24 May 2016 at 15:11 JST*

Dear Mr. Minami and Mr. Murakami, I hope all is well. Please find attached an RGB image of Mars taken last night, the 23rd May. The conditions were poor, cold weather and the seeing was bad, nevertheless there is some detail visible. I have also attached a details file with info on the individual images. If you need any more info please let me know.

I caught Sinus Meridiani on the meridian, the same view as per my submission of the 20th. Thank you.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160523/DWd23May16.jpg>

**David WELDRAKE** (NSW, AUSTRALIA)

●.....*Subject: Mars on 2016 May 21 at 00h 00m*  
*Received: 21 May 2016 at 17:55 JST*

Hello, Attached you can find my image. As I used a diagonal prism, the N-S axis is ok, but the E-W axis is in mirror. Please, rotate and mirror the E-W axis if you need it to publish the image. I have tried to identify the geographical accidents as you can see. Please, ask me anything you want. Thanks in advance.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160521/LFn21May16.jpg>

○.....*Subject: Re: Mars on 2016 May 28 at 23h 50m*  
*Received: 30 May 2016 at 01:55 JST*

Hello, Attached you can find my image. Please, ask me anything you want. Thanks in advance.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160528/LFn28May16.jpg>

**Luis FERNÁNDEZ Navarro**  
(Bormujos, Sevilla, SPAIN)

●.....*Subject: Mars RGB set 20-05-2016*  
*Received: 21 May 2016 at 19:46 JST*

Hi everyone, After many days of unfavourable conditions, last night it cleared enough for useful imaging. Transparency wasn't too good, with high level haze, but the seeing was reasonably good.

Best regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160520/SBd20May16.jpg>

○.....*Subject: Mars image set 2016-05-24*  
*Received: 25 May 2016 at 20:30 JST*

Hello everyone, Please find attached an RGB set from last night, captured in better than average seeing.

Best regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160524/SBd24May16.jpg>

○.....*Subject: Mars RGB set 27-05-2016*  
*Received: 28 May 2016 at 11:22 JST*

Hi everyone, Managed to capture one RGB set just seconds before the clouds rolled in. The seeing was reasonably good. Best regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160527/SBd27May16.jpg>

○.....*Subject: Mars closest approach*  
*Received: 31 May 2016 at 17:03 JST*

Hi everyone, Last night the seeing looked very promising early on in the session but unfortunately it did not last long enough to catch Mars at a higher altitude. Even so I think this is my best Mars image set to date. Best regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160530/SBd30May16.jpg>

**Stefan BUDA** (Melbourne, AUSTRALIA)

●.....*Subject: Mars 2016-05-21*  
*Received: 23 May 2016 at 23:00 JST*

Hi, here my mars from 21th may 2016, captured during full Moon nearby and the sky covered by Cirrusclouds. Hard conditions... Cheers

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160521/SKw21May16.jpg>

**Silvia KOWOLLIK** (Ludwigsburg, GERMANY)

●.....*Subject: Mars Sketch 25 May 2016*  
*Received: 27 May 2016 at 04:01 JST*

Dear Sirs, Please find attached my latest sketch of Mars. Information is below. Thank you,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160525/MRs25May16.jpg>

**Michael ROSOLINA** (Friars Hill, WV)

**Robert SCHULZ** (Vienna, AUSTRIA)

●.....*Subject: Mars images*  
 Received: 27 May 2016 at 20:02 JST

Dear Sirs, Please find attached a Mars image set from the 15th May 2016. Best regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160515/MJs15May16.jpg>

**Mark JUSTICE** (Melbourne, AUSTRALIA)

●.....*Subject: from Masatsugu MINAMI's Facebook*  
 Received: 28 May 2016 at 22:28 JST

<http://arxiv.org/abs/1603.05906>  
 (Plasma observations during the Mars atmospheric "plume" event of March-April 2012)

Wayne Jaeschke  
 24 May at 07:59  
 West Chester, PA, United States ·

Interesting article on the Mars Plume occurrence from 2012. Interestingly, their paper concurs with the initial theory of Masatsugu Minami. Many of the astronomers I discussed the theory with, at the time, discredited the idea (even though we knew that there was a strong, fast CME hitting Mars at the time and the plume was over the area of the planet with its highest crustal magnetism).

**Wayne JAESCHKE** (West Chester, PA)

●.....*Subject: Mars observation from 26th May 2016*  
 Received: 30 May 2016 at 05:10 JST

Dear CMO/OAA-team ! Here is my latest Mars observation from 26th May 2016. best regards

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160526/RSz26May16.jpg>

●.....*Subject: Mars 26 May 2016*  
 Received: 30 May 2016 at 16:43 JST

Dear Sir, Attached find two images of Mars of May 26, 2016. The seeing was poor due to the low altitude (15°). Note the bright spot near Elysium. Regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160526/JSb26May16.jpg>

**John SUSSENBACH** (Houten, The NETHERLANDS)

●.....*Subject: Mars 2016/05/28*  
 Received: 31 May 2016 at 03:52 JST

Hello, here is a set under average to good seeing but low altitude. Both polar hoods are visible. Clouds in Tempe, Aurorea Sinus and Solis Lacus. In the IR image more surface details are visible especially near the north pole.

[http://www.astrovox.gr/forum/album\\_pic.php?pic\\_id=19780](http://www.astrovox.gr/forum/album_pic.php?pic_id=19780)  
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160528/MKd28May16.jpg>

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

●.....*Subject: Mars May 10*  
 Received: 31 May 2016 at 03:48 JST

Mars on May 10

Those who say it can't be done should stay out of the way of those who are doing it.

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/160510/PMx10May16.jpg>

**Paul MAXSON** (Surprise, AZ)

☆☆☆

## **International Society of the Mars Observers (ISMO)**

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

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

**CMO n°449/ ISMO #75** (10 June 2016)

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



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