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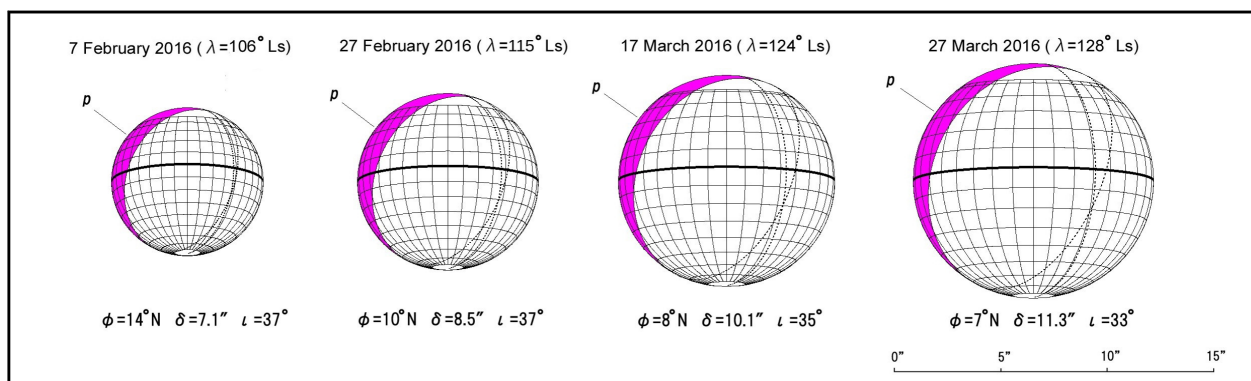
Forthcoming 2016 Mars (#04)

The Martian Disks for the 2016 Mars. Part I

By

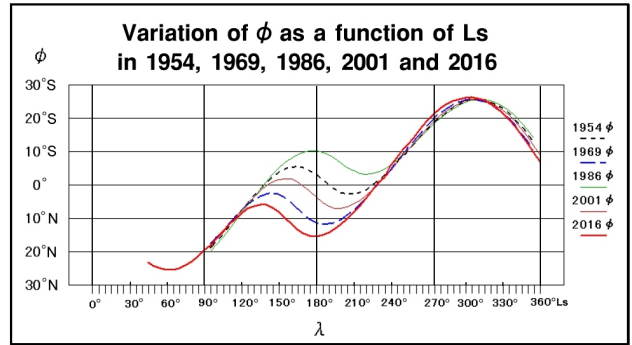
Akinori NISHITA

WE here, as a regular programme, display how the size and phase of the planet Mars varies together with the grids of the longitude-latitude lines in 2016 from 7 February when $\delta=7.1''$, $\lambda=106^\circ\text{Ls}$, $\phi=14^\circ\text{N}$, $\iota=37^\circ$ up until the time when the planet becomes closest to the Earth on 30 May ($\delta=18.6''$, $\lambda=161^\circ\text{Ls}$, $\phi=12^\circ\text{N}$, $\iota=07^\circ$), where δ , λ , ϕ , and ι denote the apparent diameter, the season in terms of the areocentric longitude of the Sun, the tilt and the phase angle respectively. The data after 30 May will be treated in a following issue as Part II. The disks are shown with the south polar area being located upper. The equatorial line is shown with a heavy line. The p -indication denotes the direction of the planet which is moving inside the ocular-field when we stop the automatic tracking system of the telescope. This determination will be exactly useful when we want to know the Martian axial tilt of the rotating/floating planet; that is, it determines the $p \leftarrow f$ segment which was used by Don PARKER and Yukio MORITA to see how the centre of the south polar cap deviates from the southern pole.

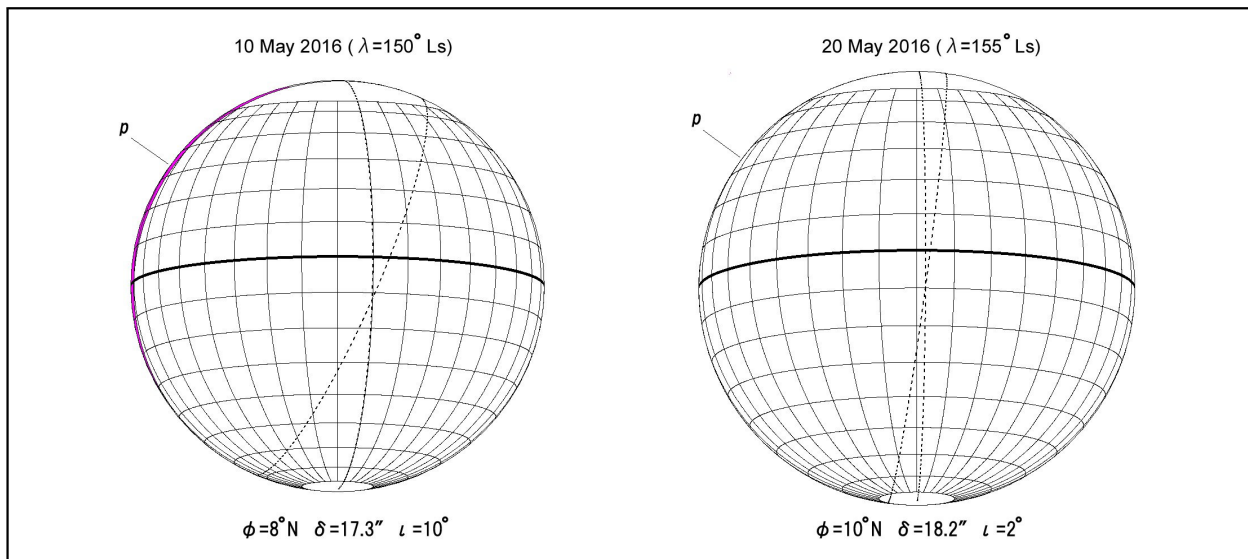
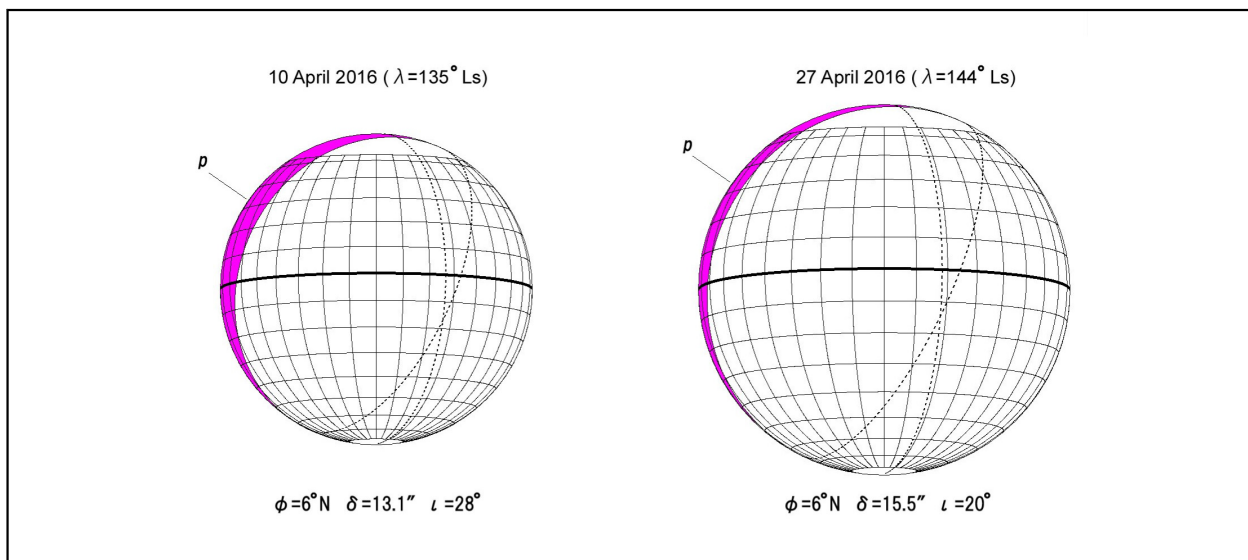


There are shown two dotted lines inside the disks. You will see one that shows the noon line (so we sometimes call the N-line) in MLT (Martian Local Time), which is parallel to the longitudinal lines. The other dotted line is the one that is perpendicular to the great circle of the boundary of the defect of the illumination (which we call sometimes the M-line). The intersection of the N-line and the M-line indicates the Sub-Solar Point.

As a decisive characteristic feature of the present apparition, the Sub-Earth-Point comes down near the equator, and so the circumpolar regions look to be difficult to observe. As has well been shown by Masami MURAKAMI (*Mk*) in CMO #439 (we also borrow the same Figure here→), the variation of the tilt ϕ behaves similarly in 2016 to the variations in 1954, 1969, 1986 and 2001. However the case in 2016 will be different from other cases at the season from $\lambda=150^\circ\text{Ls}$ to $\lambda=200^\circ\text{Ls}$.

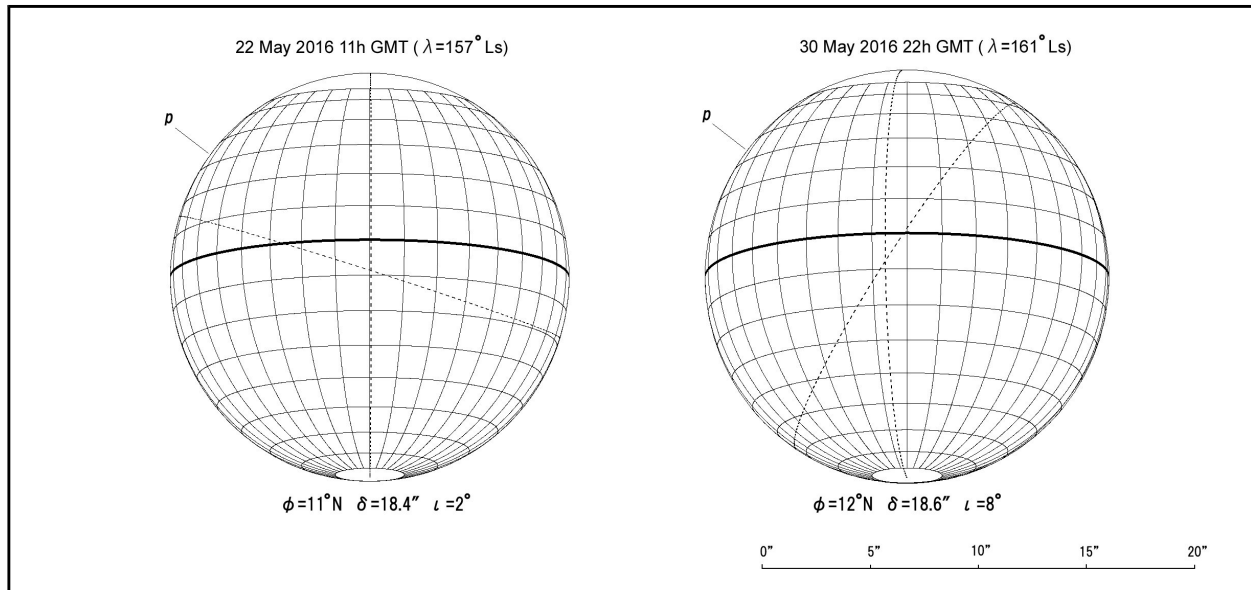


Especially note that the variation of the tilt in 2016 looks to work too northward. As has been pointed out by *Mk*, it may be highly probable for us in this apparition to be able to catch the so-called glint phenomenon at Edom Promontrium, while the above diagrams



show that the case in 2016, because the tilt looks too northward, should be said a bit different from the cases in 1954 and 2001 when the observations of the glints were successful. A further consideration will be given in a subsequent issue of this CMO by *Mk* and others.

The disk on 22 May ($\lambda=155^\circ\text{Ls}$) is the one when the planet is at opposition. We also show the case on



20 May ($\lambda=157^\circ\text{Ls}$) because this is the day where the glint will be expected. After opposition the M-line rapidly declines and will be inverted to show that the left-hand side of M line will be totally bright, and the phase defect will appear at the morning terminator. (To be continued)

CMO/ISMO 2016 Mars Report #01

2016 Mars Observations up until 30 November 2015

♂.....The Mars observation of the 2016 apparition was first made in September 2015. This article treats therefore the observations made during the period from 20 September 2015 until the end of November 2015. Hence the season we cover this time is from $\lambda=044^\circ\text{Ls}$ to $\lambda=075^\circ\text{Ls}$ on 28 November 2015. The apparent diameter δ just went up from 3.8" to 4.7". The central latitude ϕ was rather stable around at $23^\circ\text{N} \sim 24^\circ\text{N}$ so that the north polar cap (npr) was evident. The phase angle ι augmented from 19° to 30° . The apparent declination D was from 11.3°N down to 02.7°S ; this will further be going down southward hereafter.

♂.....The observers who kindly contributed this period read as follows:

FELL, Denis (DFI) Kennedy, SK, CANADA

3 Colour Drawings (20 Sept; 18 Oct; 8 Nov 2015) 15cm Maksutov-Cassegrain, 180 \times , 240 \times , 300 \times

FOSTER, Clyde (CFs) Centurion, SOUTH AFRICA

3 IR Images (27 Sept; 18 Oct; 16 Nov 2015) 36cm SCT @f/22 with an ASI 120MM, ASI 224MC

KARDASIS, Manos (MKd) Glyfada-Athens, GREECE

1 Colour Image (18 November 2015) 36cm SCT with a DBK21

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

1 R Image (31 October 2015) 25cm SCT with a Starlight Xpress

MORALES RIVERA, Efrain (EMr) Aguadilla, PUERTO RICO

1 Set of RGB Images (15 November 2015) 31cm SCT with a Flea 3

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

5 Sets of RGB + 5 LRGB Colour Images (3, 10, 14, 15, 28 November 2015) 36cm SCT with a Flea 3

♂..... This apparition, also, we began to receive the hottest Martian images earlier than we expected. The first drawing reached us via Facebook from Denis FELL (DFI), his drawing being the one made on 20 September 2015 ($\lambda=044^\circ\text{Ls}$) at $\omega=219^\circ\text{W}$. The apparent diameter δ was then 3.8" and hence this was a bit earlier than the one when Manos KARDASIS (MKd) started in the preceding 2013|2014 apparition, namely on 27 July 2013 when $\delta=3.9''$. However in 2013 some explicitly nicer images were put forth later by Peter GORCZYNSKI (PGr) on 11 August 2013 ($\lambda=005^\circ\text{Ls}$) and on 17 August 2013 ($\lambda=008^\circ\text{Ls}$) when $\delta=4.0''$, and hence it is not so pertinent to compare.

Our star of hope Clyde FOSTER (CFs) started on 27 September 2015 ($\lambda=047^\circ\text{Ls}$) when δ was 3.9". The difference of the season by about 40°Ls must be due to the displacement of the opposition times.

When the apparent diameter is quite small, it is sometimes not easy to tell what are the markings. In those cases, it is recommended to refer to the cases in the preceding apparition or the apparition before last. The season λ and the LCM ω may be kept similar but the angular diameter is chosen to be somewhat larger. For example, the images made by Yukio MORITA (Mo) on 3 November 2015 ($\lambda=064^\circ\text{Ls}$) at $\omega=223^\circ\text{W}$ look to be difficult to decipher the configuration of the surface, while if we refer to the image of Johan WARELL (JWr) taken on 31 January 2012 ($\lambda=064^\circ\text{Ls}$), we can easily notice that Elysium is conspicuous suggesting other environment because of a slightly larger diameter, and conversely we are led to find Utopia on Mo's images. On the Mo images the following part of the Ætheria dark patch is more shadowy.

How about then the image given by Frank MELILLO (FMI) on 31 October 2015 ($\lambda=062^\circ\text{Ls}$) at $\omega=156^\circ\text{W}$? It shows some shadowy marking but it is not so easily grasped. So let's look for an image with $\lambda=062^\circ\text{Ls}/\omega=156^\circ\text{W}$ in the 2012 Gallery. Then an image given by Sadegh GHOMIZADEH (SGh) on 29 January 2012 ($\lambda=064^\circ\text{Ls}$) at $\omega=158^\circ\text{W}$ is suggestive. The elements are not exactly the same, but the configuration on SGh's image is rather clear concerning the evening clouds at Olympus Mons and Tharsis Montes. In this sense FMI's image does not yet show the evening discrete clouds, and the dark band near Phlegra and the morning Elysium are missing on the FMI image. The reason why the shadowy spread is suggested at the preceding area of Cerberus is mysterious. Note that the north polar cap (npc) is not described though in R light.

Now we turn to a further review of other observations:

CFs's IR image on 18 October 2015 ($\lambda=056^\circ\text{Ls}$) at $\omega=133^\circ\text{W}$ looks featureless in general, while Propontis I looks to be visible.

DFI's second drawing was made on 18 October 2015 ($\lambda=057^\circ\text{Ls}$) at $\omega=240^\circ\text{W}$. Syrtis Mj is described, but markings look more scattered near the limb boundary; this must be because the drawing circle is unnecessarily larger than the details. DFI's third drawing was made on 8 November 2015 ($\lambda=066^\circ\text{Ls}$) at $\omega=034^\circ\text{W}$: M Acidalium is evident to the south of the clear npc. At the southern limb a white point is visible: Is it Argyre?

Mo obtained a set of images on 10 November 2015 ($\lambda=067^\circ\text{Ls}$) at $\omega=154^\circ\text{W}$. The surface looks featureless. Compared with Silvia KOWOLLIK (SKw)'s images on 6 February 2012 ($\lambda=067^\circ\text{Ls}$) at $\omega=152^\circ\text{W}$, which show some scattered white clouds at Olympus Mons and Tharsis Montes, and as well Propontis I, while Mo's images do not yet show these details. The shadowy central area may not be physical.

Mo's images on 14 November 2015 ($\lambda=068^\circ\text{Ls}$) at $\omega=117^\circ\text{W}$ are similar. It may show the evening cloud patch.

Efrain MORALES (EMr) produced one of the best images during this period on 15 November 2015 ($\lambda=069^\circ\text{Ls}$) at $\omega=304^\circ\text{W}$: Sinus Sabæus stays exquisitely on the morning side and Syrtis Mj is clearly dark.

The description of the dark area around the npc is nice. Now $\delta=4.5''$.

Mo produced a set of images on the same day at $\omega=099^\circ\text{W}$. Details are not shown, but the images are mild, and a trace of M Acidalium near the p terminator and a white cloud patch at Xanthe (seen explicitly on G and B images).

CFs gave an IR image on 16 November 2015 ($\lambda=069^\circ\text{Ls}$) at $\omega=200^\circ\text{W}$. The black Cimmerium Mare thickly lies near the southern limb. Elysium is dimly visible. Maybe the time is to start of the colour decomposition observations.

Manos KARDASIS (MKd) issued a single colour image on 18 November 2015 ($\lambda=070^\circ\text{Ls}$) at $\omega=202^\circ\text{W}$: The tinge is a bit dingy, but Elysium is explicit and the Cebrenia broad light zone is shown. Maybe a white cloud at the morning southern limb is shot.

Finally Mo produced as usual a set of LRGB, RGB, R, G, B images on 28 November ($\lambda=075^\circ\text{Ls}$) at $\omega=350^\circ\text{W}$. In R, the position of M Acidalium is well fixed and S Meridiani is well separated from Margaritifer S. The light Chryse is near the f limb.

The URL concerned above are as follows:

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/150920/DFI20Sept15.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/151018/DFI18Oct15.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/151108/DFI08Nov15.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/150927/CFs27Sept15.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/151018/CFs18Oct15.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/151108/CFs16Nov15.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/151118/MKd18Nov15.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/151031/FMI31Oct15.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/151115/EMr15Nov15.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/151103/Mo03Nov15.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/151110/Mo10Nov15.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/151114/Mo14Nov15.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/151115/Mo15Nov15.jpg>

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/151128/Mo28Nov15.jpg>

Masami MURAKAMI and Masatsugu MINAMI

Forthcoming 2016 Mars (#05)

Ephemeris for the Observations of the 2016 Mars. II
January & February 2016

By

Masami MURAKAMI

As a sequel to the preceding list of the Ephemeris for the physical observations of Mars, we here list up the necessary elements of the Ephemeris for period from 01 January 2016 to 29 February 2016: The data are listed for every day at 00:00 GMT (not TDT). The symbols ω and ϕ denote the Longitude and Latitude of the sub-Earth point respectively. The symbols λ , δ and ι stand for the Areocentric Longitude of the

Sun, the Apparent Diameter and the Phase Angle respectively. We also add the column of the Position Angle Π of the axis rotation, measured eastwards from the north point: This is useful when we try to determine the north pole direction from the $p \leftarrow \rightarrow f$. The Apparent Declination of the planet is also given at the final column (denoted D). The data here are basically based on *The Astronomical Almanac for the Year 2016*.

Date (00:00GMT)	ω	ϕ	λ	δ	ι	Π	D
01 January 2016	061.82°W	20.26°N	089.07°Ls	5.56"	34.2°	36.9°	-09°32'
02 January 2016	052.16°W	20.10°N	089.51°Ls	5.59"	34.3°	37.0°	-09°45'
03 January 2016	042.51°W	19.95°N	089.95°Ls	5.63"	34.5°	37.1°	-09°57'
04 January 2016	032.86°W	19.79°N	090.39°Ls	5.66"	34.6°	37.2°	-10°09'
05 January 2016	023.21°W	19.63°N	090.83°Ls	5.69"	34.7°	37.3°	-10°20'
06 January 2016	013.57°W	19.47°N	091.27°Ls	5.73"	34.8°	37.3°	-10°31'
07 January 2016	003.92°W	19.30°N	091.72°Ls	5.76"	34.9°	37.4°	-10°43'
08 January 2016	354.29°W	19.14°N	092.16°Ls	5.80"	35.0°	37.5°	-10°54'
09 January 2016	344.65°W	18.97°N	092.60°Ls	5.83"	35.1°	37.6°	-11°05'
10 January 2016	335.02°W	18.80°N	093.05°Ls	5.87"	35.2°	37.7°	-11°16'
11 January 2016	325.39°W	18.63°N	093.49°Ls	5.91"	35.3°	37.7°	-11°27'
12 January 2016	315.76°W	18.46°N	093.94°Ls	5.94"	35.4°	37.8°	-11°38'
13 January 2016	306.13°W	18.29°N	094.38°Ls	5.98"	35.5°	37.9°	-11°49'
14 January 2016	296.50°W	18.12°N	094.82°Ls	6.02"	35.6°	37.9°	-12°00'
15 January 2016	286.89°W	17.95°N	095.27°Ls	6.06"	35.7°	38.0°	-12°10'
16 January 2016	277.27°W	17.77°N	095.71°Ls	6.10"	35.7°	38.0°	-12°21'
17 January 2016	267.66°W	17.60°N	096.15°Ls	6.14"	35.8°	38.1°	-12°31'
18 January 2016	258.05°W	17.43°N	096.60°Ls	6.18"	35.9°	38.1°	-12°41'
19 January 2016	248.44°W	17.25°N	097.05°Ls	6.23"	36.0°	38.2°	-12°52'
20 January 2016	238.84°W	17.08°N	097.49°Ls	6.27"	36.0°	38.2°	-13°02'
21 January 2016	229.24°W	16.90°N	097.94°Ls	6.31"	36.1°	38.2°	-13°12'
22 January 2016	219.64°W	16.72°N	098.39°Ls	6.36"	36.2°	38.3°	-13°22'
23 January 2016	210.04°W	16.54°N	098.83°Ls	6.40"	36.3°	38.3°	-13°31'
24 January 2016	200.45°W	16.36°N	099.28°Ls	6.45"	36.3°	38.3°	-13°41'
25 January 2016	190.86°W	16.18°N	099.72°Ls	6.49"	36.4°	38.3°	-13°51'
26 January 2016	181.27°W	16.00°N	100.17°Ls	6.54"	36.5°	38.4°	-14°00'
27 January 2016	171.69°W	15.82°N	100.62°Ls	6.59"	36.6°	38.4°	-14°10'
28 January 2016	162.11°W	15.64°N	101.07°Ls	6.63"	36.6°	38.4°	-14°19'
29 January 2016	152.53°W	15.46°N	101.52°Ls	6.68"	36.7°	38.4°	-14°28'
30 January 2016	142.96°W	15.28°N	101.97°Ls	6.73"	36.8°	38.4°	-14°37'
31 January 2016	133.39°W	15.10°N	102.42°Ls	6.78"	36.8°	38.4°	-14°46'
01 February 2016	123.82°W	14.92°N	102.86°Ls	6.83"	36.9°	38.4°	-14°55'
02 February 2016	114.25°W	14.74°N	103.31°Ls	6.88"	36.9°	38.4°	-15°04'
03 February 2016	104.69°W	14.56°N	103.76°Ls	6.93"	36.9°	38.4°	-15°13'
04 February 2016	095.13°W	14.38°N	104.22°Ls	6.99"	37.0°	38.4°	-15°21'
05 February 2016	085.59°W	14.20°N	104.67°Ls	7.04"	37.0°	38.3°	-15°30'

Date (00:00GMT)	ω	ϕ	λ	δ	ι	Π	D
06 February 2016	076.03°W	14.02°N	105.12°Ls	7.09"	37.0°	38.3°	-15°38'
07 February 2016	066.48°W	13.84°N	105.57°Ls	7.15"	37.0°	38.3°	-15°46'
08 February 2016	056.93°W	13.66°N	106.03°Ls	7.21"	37.1°	38.3°	-15°54'
09 February 2016	047.39°W	13.48°N	106.48°Ls	7.26"	37.1°	38.3°	-16°02'
10 February 2016	037.85°W	13.30°N	106.93°Ls	7.32"	37.1°	38.2°	-16°10'
11 February 2016	028.32°W	13.12°N	107.39°Ls	7.38"	37.1°	38.2°	-16°18'
12 February 2016	018.79°W	12.94°N	107.84°Ls	7.44"	37.2°	38.2°	-16°26'
13 February 2016	009.26°W	12.76°N	108.30°Ls	7.50"	37.2°	38.1°	-16°33'
14 February 2016	359.74°W	12.58°N	108.75°Ls	7.56"	37.2°	38.1°	-16°41'
15 February 2016	350.22°W	12.41°N	109.21°Ls	7.63"	37.2°	38.0°	-16°48'
16 February 2016	340.70°W	12.23°N	109.66°Ls	7.69"	37.2°	38.0°	-16°56'
17 February 2016	331.19°W	12.06°N	110.12°Ls	7.76"	37.2°	38.0°	-17°03'
18 February 2016	321.68°W	11.88°N	110.57°Ls	7.82"	37.2°	37.9°	-17°10'
19 February 2016	312.18°W	11.71°N	111.03°Ls	7.89"	37.2°	37.9°	-17°17'
20 February 2016	302.68°W	11.54°N	111.49°Ls	7.96"	37.2°	37.8°	-17°24'
21 February 2016	293.18°W	11.37°N	111.94°Ls	8.02"	37.1°	37.8°	-17°30'
22 February 2016	283.69°W	11.20°N	112.40°Ls	8.09"	37.1°	37.7°	-17°37'
23 February 2016	274.20°W	11.03°N	112.86°Ls	8.16"	37.1°	37.7°	-17°43'
24 February 2016	264.72°W	10.87°N	113.32°Ls	8.24"	37.0°	37.6°	-17°50'
25 February 2016	255.23°W	10.70°N	113.78°Ls	8.31"	37.0°	37.5°	-17°56'
26 February 2016	245.76°W	10.53°N	114.24°Ls	8.38"	36.9°	37.5°	-18°02'
27 February 2016	236.29°W	10.37°N	114.70°Ls	8.46"	36.9°	37.4°	-18°09'
28 February 2016	226.82°W	10.21°N	115.17°Ls	8.54"	36.8°	37.4°	-18°14'
29 February 2016	217.36°W	10.05°N	115.63°Ls	8.61"	36.8°	37.3°	-18°20'
01 March 2016	207.90°W	09.89°N	116.09°Ls	8.69"	36.7°	37.2°	-18°26' - - -

Letters to the Editor

●.....**Subject: 10 14 15 28 Nov_2015**
Received: 29 November 2015 at 23:52 JST

Please find attached some images which were taken during the period 10~28 November. The planet at dawn is gradually higher, and we barely have some minutes to shoot, though the seeing remains poor.

With best wishes,
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/151110/Mo10Nov15.jpg>
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/151114/Mo14Nov15.jpg>
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/151115/Mo15Nov15.jpg>
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/151128/Mo28Nov15.jpg>

Yukio MORITA (Hiroshima, JAPAN)

●.....**Subject: Mars 1 December 2015 IR**
Received: 1 December 2015 at 13:32 JST

Hi, All, An IR capture of Mars from this morning,

with Mare Acidalium, Niliacus Lacus, Nilokeras and Mare Erythræum all prominent. I have taken RGB's as well, so will see what I can get out of them in due course. Best regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/151201/CFs01Dec15.jpg>

○.....**Subject: Mars 5 December 2015 IR**
Received: 5 December 2015 at 20:30 JST

Hi, All, An IR capture of Mars from this morning, with Mare Acidalium, Niliacus Lacus, and Mare Erythræum all prominent. Margaritifer Sinus and Sinus Meridiani also clearly visible. Unfortunately I was not able to capture RGB's this morning.

Best regards,
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/151205/CFs05Dec15.jpg>

○.....**Subject: RE: Mars 5 December 2015 IR**
Received: 6 December 2015 at 03:09 JST

Hi, All, I have received a few comments on the apparent "bridge" (canal?!) linking Oxia Palus (at the tip of Margaritifer Sinus) with Niliacus Lacus, which is apparently not normally as distinct as it appears in

my image. On my reference map this is shown as a lightly shaded link, named "Indus". Looking at all the IR images I took, it does seem fairly evident, but it could still be a processing artifact. I also took three Red (610nm) captures after the IR's, but conditions were deteriorating quite quickly with the approach of Sunrise. I have attached the Red image for comparison, and the Indus "bridge" is not as evident.

Best regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/151205/CFs05Dec15.jpg>

○…*Subject: Mars 11 December 2015 RGB*
Received: 12 December 2015 at 16:06 JST

Hi all, An attempt to get "back in the groove", with my RGB imaging. Still a bit of a struggle to get reasonable G and B images. Mars now at 5". Best regards,

<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmons/2016/151211/CFs11Dec15.jpg>

○…*Subject: RE: Mars 11 December 2015 RGB*
Received: 12 December 2015 at 20:06 JST

Hi Gents, My apologies for bothering you again, but I have found out a few interesting things regarding the ASI224MC camera I am using and also my processing technique/s (or rather the lack of....!!!)

After I took the various R, G, B and IR captures on the 11th, I decided to take a couple of colour captures as well. After I had sent off my RGB/IR images earlier this morning, I thought I would have a look at the colour captures.

Having processed them I was rather surprised to see that the final colour image showed substantially more detail (at least it looks like real detail to me, comparing with my maps) than the RGB. Colour balance is not great, but the difference between the quality of the images is obvious.

A few examples of areas that are more evident in the colour capture (please excuse what I am sure is an artefact extending off the NPC, which seems to originate from the G and B channels):

Deuteronilus; Boreosyrtris; Nilosyrtris; A bright and a dark spot in the centre of Syrtis Major?; Pandoræ Fretum?; Hellas (right on the limb); The faint dusting below Sinus Sabæus. I thought I would investigate a bit further and went ahead and split the channels (R,G,B) of the colour capture.

Again, I was (pleasantly) surprised to find that the individual channels (certainly for the R and G) produced significantly better results than the R and G single filter captures that I had obtained.

A few comments: For my R,G,B captures, I capture in RAW format and process in Autostakkert under the RGGB debayer. Then go to Registax (where I convert to B+W) for wavelets and the Winjupos before Photoshop.

I am not sure my RGB process is optimised, or for that matter "correct", as I would have thought I would have got a better image from the RGB than the colour capture. The other way to look at it is that I just still have a HUGE amount to learn about capturing and processing my images :-). Having said that, and having goy used to the mono cameras, I am not sure that I am using the ASI224MC in the correct way for the filtered images.

It looks like in colour mode that the ASI224MC is really producing some good (great?) detail.

I am wondering if it is not worthwhile to go back to



a mono camera for the single filter captures, and RGB processing, whilst still considering the ASI224MC for comparing colour captures?

Any comments are more than welcome!!

PS: I duplicated the IR 685 capture from this morning and included it for comparison. Best regards,

○…*Subject: RE: Mars 11 December 2015 RGB*
Received: 12 December 2015 at 22:12 JST

Thanks Marc. I thought there would be some benefit on the single channel captures due to using the full bayer matrix, but as you have indicated, the benefit

through the other matrix elements is unlikely to add much, if anything. So likely better results with a mono? I do have an ASI174MM, so will give it a try with my Mars and Jupiter imaging. I believe I will probably need to go up to a 3× Barlow to get the right "/pixel. Out of interest I grabbed a couple of quick colour images of Jupiter yesterday. I processed quickly and not particularly well. I did however notice an "eye" in the NEB (complete with eyebrow.... :-) ,.....

Cheers for now and I hope things have settled down a bit over there. Best regards,

○.....*Subject: Re: Mars 11 December 2015 RGB*
Received: 15 December 2015 at 14:21 JST

Thanks for the comments Jim. Regarding your question I capture in RAW with the debayering deactivated during capture. There is a tickbox in Firecapture for this. Looks like I should keep to the RAW, IR and possibly CH4 band imaging with the ASI224MC, and consider the monos (ASI120MM, ASI174MM) for the R,G,B's. Splitting the channels from the colour capture can be used if I am tight on time, or weather is intermittent. I will continue to experiment, and look forward to what Mars will show us this apparition. Plenty of time, and Mars will be beautifully placed from down here. Just not sure what our conditions will be like, as this summer has definitely been "strange" so far (everything from drought and intense heat to chilly, windy, hailstorms)....

Best regards,

Clyde FOSTER (Centurion, SOUTH AFRICA)

●.....*Subject: Mars: December 5, 2015*
Received: 9 December 2015 at 10:17 JST

Hi, I am sending my latest image of Mars December 5, 2015 to be posted. I used the Moon as a guide to find Mars about 5° away in daylight hours. Thanks,
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/151205/FMI05Dec15.jpg>

Frank J MELILLO (Holtsville, NY)

●.....*Subject: RE: Mars 11 December 2015 RGB*
Received: 12 December 2015 at 21:40 JST

Hi Clyde, With a color camera, I do not expect that doing RGB would improve the result compared to using directly all of the colors. Your process is correct

for me, but you cannot get much more sensitivity using an R filter with the color camera compared to use the R layer of the color image (you might get a bit more if the green (or blue) bayer matrix filter let a bit of red wavelength pass, but not that much). The only thing that could change is if you use an atmospheric dispersion corrector, because you could get better correction for each filter acquisition than for a color acquisition. The rest might just be a matter of turbulence/focus/reinforcement variation between the two series. I did not use my ASI224MC on Mars/Jupiter, but my plan is rather to use the ASI224MC for its better sensitivity with IR/CH4 filters, and a monochrome (ie ASI120MM or ASI174MM) for the R, G and B acquisitions. Hope that helps,

Marc DELCROIX (Tournefeuille, FRANCE)
<http://astrosurf.com/delcroix>

●.....*Subject: RE: Mars 11 December 2015 RGB*
Received: 12 December 2015 at 23:01 JST

Clyde -- I'm glad that you are experimenting in this way -- it's the trying of different methods that will ultimately lead to the best images possible. The increased detail that you have noticed in your second-processed, color-camera images is artefact. A simple way to perceive this is to note that it all has the same spacial frequency -- that is, all the contrast detail has the same width. As you enhance contrast by adjusting wavelet strengths, the limitation on each wavelet's strength is the appearance of a "background" of pervasive detail at the spacial frequency controlled by that wavelet. That's what we are seeing in this image with the light spot in Syrtis Major and the regularly spaced dark spots across Aeria, Arabia, and Eden. I am enjoying your images. Please keep up this good work.

Roger VENABLE (Mars Section, A.L.P.O.)

●.....*Subject: Mars - December 11th, 10:10ut*
Received: 13 December 2015 at 05:49 JST

Hi Mr. Masatsugu!, Here is my latest session from December 11th, 10:10ut.
<http://www.kwasan.kyoto-u.ac.jp/~cmo/cmoms/2016/151211/EMr11Dec15.jpg>

Efrain MORALES (Aguadilla, PUERTO RICO)

●.....*Subject: Re: Mars 11 December 2015 RGB*
Received: 15 December 2015 at 12:40 JST

Hi Clyde, Based on your results, I suggest that you to keep using raw frames from the color camera. Unless you prefer using rgb avis from a monochrome camera. That's fine too. Am I right that you captured raw color frames for the Color, IR, RGB monochrome frames? I think the dark marking detail is real and very detailed when compared with Ebisawa's map. The red frame dark markings match that of the Color image and the color balance looks good to me. There may be artifacts running alongside the Western limb, but that's no biggie. What really stands out to me is Nilosyrtis that has mostly vanished in recent apparitions. A noticeable change is a new broad dark band under Sabæus Sinus. When I start imaging Mars I plan on using raw color frames for the Color, IR, RGB monochrome frames and then Debayering them with ASTROPIPP. Did you see the article by Dan Llewellyn "Redeeming Color Planetary Cameras in the May 2014 S&T? See what you think. Maybe compare rgb monos with raw color frames. I'd be interested in seeing that.

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Keep up the good work! Good seeing,

Jim MELKA (Chesterfield, Mo)

I have been quite busy. Though I "retired" from my psychiatric position in October, it seems that my wife and I may soon be moving from Willmar, Minnesota to Flagstaff, Arizona. She has received quite a good job offer there, and the opportunities for me to practice professionally are much better there than here (I had a very warm welcome from the Flagstaff Medical Center when I was last in Flagstaff, in July, for the New Horizons encounter). So there is much change afoot. Next time I write, it may be from Flagstaff!

There are some events planned at Lowell Observatory for the 100th Anniversary of Percival Lowell's death. We are hoping to put together quite a wide-ranging program discussing Lowell's interests and accomplishments, in and out of astronomy. I would still like to think that you or one of your colleagues (Reiichi perhaps) could attend, and represent Lowell's Japanese legacies to us.

Without more ado, here is a text for the January CMO, as I promised you sometime ago. I will send along some illustrations that may be of interest perhaps over the next 24 hours or so.

Warm regards for the season and the New Year, 2016.

Bill SHEEHAN (Willmar, MN)

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●.....*Subject: Mars Essay for CMO*
Received: 19 December 2015 at 07:24 JST

Dear Masatsugu, Hope all is well.

International Society of the Mars Observers (ISMO)

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