

Mars in 2013–'14: Third interim report

Two earlier accounts^{1,2} of the 2014 opposition have appeared in the *Journal*. The present report picks out some more of the most interesting features, and is in no way exhaustive.

The Mars Section continues to encourage visual work as a means of getting to know the planet, to spot short-lived events more readily, and to appreciate the significance of the phenomena being witnessed. The planet lends itself to coloured representations, and some typical work is illustrated here (Figure 1).

Turning to post-opposition phenomena, on Jul 1 Clyde Foster (South Africa) captured in his images a short-lived local dust storm over *Libya–Isidis Regio* (*Isidis Planitia*) which had been absent the previous day (Figures 2A, 2B).^{3,4} The bright, multiple nucleus of this storm was striking but soon dispersed. On Jul 3 for example, Leonard E. Mercer (Malta) found the cloud much more diffuse. It may be significant that this particular location is now more active than it has been for decades.⁵ This event began at Ls= 154°, in late northern summer.

A slightly longer-lived patch of dust appeared near the NW corner of the *Hellas* basin on Aug 27, this time being found by Maurice Valimberti from Australia (Figure 2C). At Ls= 185°, this event had commenced at the start of the S. hemisphere spring season (or N. hemisphere autumn). By mid-August only Valimberti, Foster, Paul Maxson in the USA, Tiziano Olivetti in Thailand, Gianluigi Adamoli in Italy and Trevor Barry in Australia were still able to make observations: more northerly observers were defeated by the planet's proximity to the horizon at sunset.

On Oct 6, Ls had reached 209°, and now Foster, through following a near-continuous observing programme, caught yet another local dust storm, this time in *Chryse Planitia*. This striking bright yellow cloud had not been present on Oct 5: see Figures 2D & 2E. By now many months had elapsed since most observers had ended their own programmes of work. Foster imaged a second event in *Libya–Isidis Regio* on Oct 17: two days later, a secondary burst of dust ran from NW *Hellas* into *Iapigia*: see Figures 2F & 2G. Such observations upon the sub-6" disk are a testament to the skill of the observer and to the quality of digital technology. (Ls was equal to 216° on Oct 17, and 217° on Oct 19.)

The Aug–Nov observations witnessed the appearance of the S. polar ground cap from the overlying hood, and its subsequent decrease in size. The cap tends to be free from its hood just before Ls= 180°, the time of the S. spring equinox, but at that time this apparition (in 2014 mid-August) the latitude of the disk centre viewed from Earth (D_e) was around +18°, an unfavourable circumstance for watching the SPC. By late October, however, D_e had become negative, favouring observations of the cap. Trevor Barry's October images (Figure 3) are typical in showing the cap's icy whiteness along the limb. On Oct 19 there was the most unusual event of a close approach of Comet 2013 A1 (Siding

Spring) to Mars, and Martin Mobberley and Damian Peach secured images of the comet in the same star-field as the planet, after carefully pre-booking observing time on remote telescopes.

As this note was written on November 9 at Ls= 230°, a few observers were still continuing to follow the planet deep into its southern hemisphere spring. As yet there has been no sign of any planet-encircling dust storm.

Meanwhile, India has joined the list of nations successful in reaching Mars. The Indian Space Research Organisation's craft – called *Mangalyaan* – entered the Red Planet's orbit on Sep 24 and so far has been the cheapest successful mission to fly. Launched on November 5 last

year, *Mangalyaan* has a methane detector on board and should function for at least six months.

Mars will be in conjunction with the Sun on 2015 Jun 14. Members with unreported observations should send them in without delay.

Richard McKim, Director

References

- 1 R. J. McKim, *J. Brit. Astron. Assoc.*, **124**(1), 4–5 (2014).
- 2 R. J. McKim, *ibid.*, **124**(3), 119–120 (2014).
- 3 R. J. McKim, *ibid.*, **124**(5), 273 (2014).
- 4 BAA *e-Bulletin* No. 809 (2014 Jul 2)
- 5 In his monograph entitled 'Telescopic Martian Dust Storms' (*Mem. Brit. Astron. Assoc.*, **44** (1999)) the Director showed how the *Libya–Isidis Regio* site had been the most common emergence site for telescopic dust storms up to the 1960s. Its activity then subsided for decades.

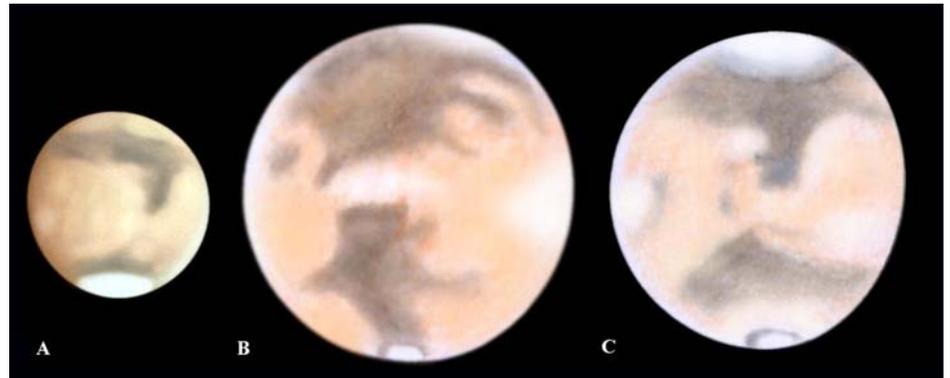


Figure 1. A. Drawing by David Gray with 415 mm DK $\times 365$ –665 on 2013 Sep 18d 05:20 UT (CM= 265°). The disk diameter was only 4.2 arcsec. Note the large N. polar cap and dull *Hellas*.

B, C. Drawings by Paul Abel with 203 mm refl. $\times 250$, and 508 mm DK $\times 356$ (Leicester University), respectively, on (B) 2014 May 17, 21:44 UT (CM= 052°) and (C) May 31, 22:03 UT (CM= 288°). The disk diameters were 13.2" and 11.9". Both drawings show examples of equatorial white cloud, which in C extends across *Syrtis Major* giving it a bluish tint. *Hellas* is white. (South is uppermost in all Figures.)

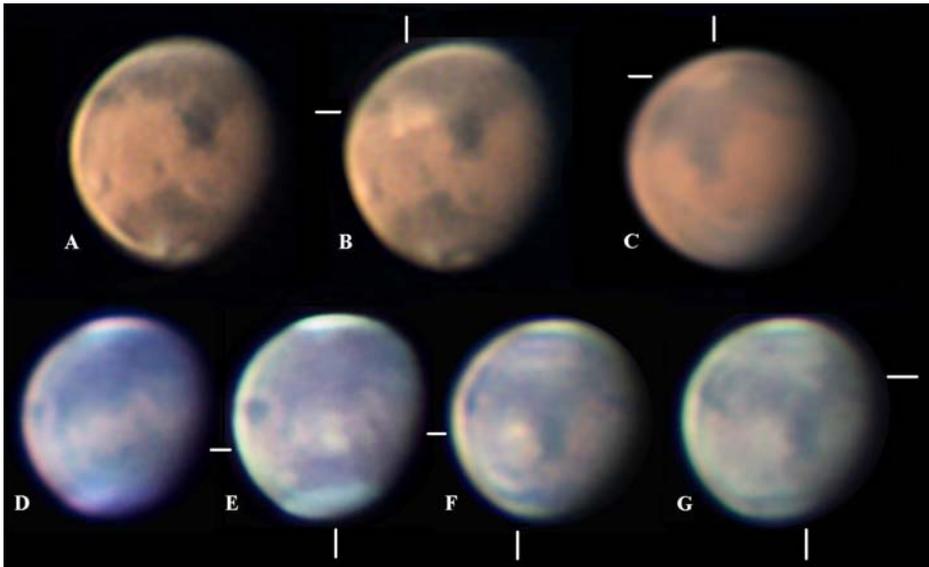


Figure 2. Post-opposition dust storm phenomena (described in the text and arrowed here), imaged by Clyde Foster (A, B, D–G; 356 mm SCT, ZWO ASI120MC camera) and Maurice Valimberti (C; 356 mm SCT, ASI120MM). RGB composites are shown.

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| A. 2014 Jun 30, 16:18 UT (CM= 281°). | E. Oct 6, 16:09-16:20 UT (CM= 050°). |
| B. Jul 1, 17:20 UT (CM= 287°). | F. Oct 18, 16:12-16:23 UT (CM=294°) |
| C. Aug 29, 08:27-08:34 UT (CM= 307°). | G. Oct 19, 16:05-15:17 UT (CM= 282°) |
| D. Oct 5, 16:07-16:18 UT (CM= 059°). | |

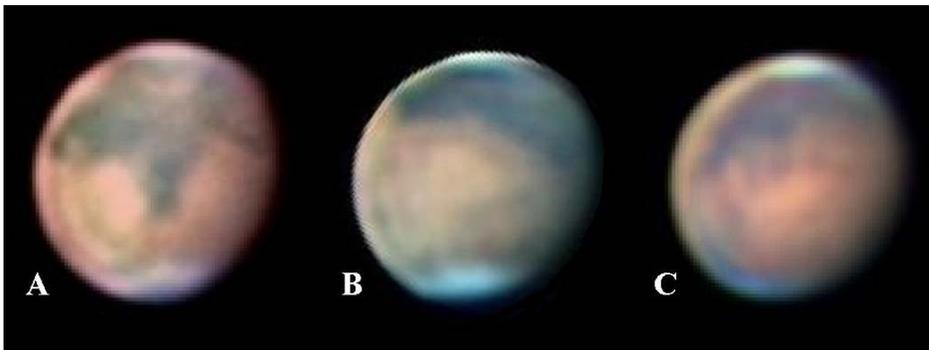


Figure 3. The S. polar cap and its preliminary shrinkage can be seen at the upper limb in these RGB composite images by Trevor Barry with 406 mm refl. and ZWO ASI120MM-S camera on **A)** 2014 Oct 8, 09:37 UT (CM= 294°); **B)** Oct 17, 09:22 UT (CM= 203°); and **C)** Oct 28, 09:40 UT (CM= 100°).