Mars Section

Mars 2011–'12: first interim report

Mars probes: the latest news

The *Curiosity* rover and NASA's *Mars Science Laboratory* mission will be featured in a forthcoming Section Note about the proposed landing site in Gale crater. The probe was launched successfully on 2011 Nov 26, and further details are to be found in the popular press. (See for example E. Lakdawalla, *Sky & Telesc.*, **122**(6) 22–30 (2011).) Touchdown – and its landing will certainly be both novel and daring – will be between 2012 Aug 6 and 20, and the nominal mission life will be 687 Sols.

The Russians had intended to recommence their unmanned planetary programme with their *Phobos-Grunt* craft. This probe, launched on 2011 Nov 8, was intended to land on Phobos and return a soil sample to Earth. It carried *Yinghou-1* (Firefly), a small Chinese Mars orbiter, which would have been released into martian orbit. However, the Russian probe failed to leave Earth orbit. Our contributor from the Netherlands, Ralf Vandeberg, is experienced in imaging the International Space Station and other orbiting objects, and was able to catch *Phobos-Grunt* on several occasions (see Figure 1). He writes: 'This picture was taken on November 29, when I first had a chance to observe the stranded Russian probe on the second day of the visible observing window over the Netherlands... *Phobos-Grunt* was passing close to Altair... *Phobos-Grunt* roared across the sky as bright as a star. It had an obvious reddish colour visible in the tracking scope, or at least that was my impression in the few seconds of the pass, while I was concentrated on aligning the crosshairs of my viewfinder with an object passing by with an angular velocity of 1.68 degrees per second.'

The craft re-entered the atmosphere and burnt up on 2012 Jan 15.

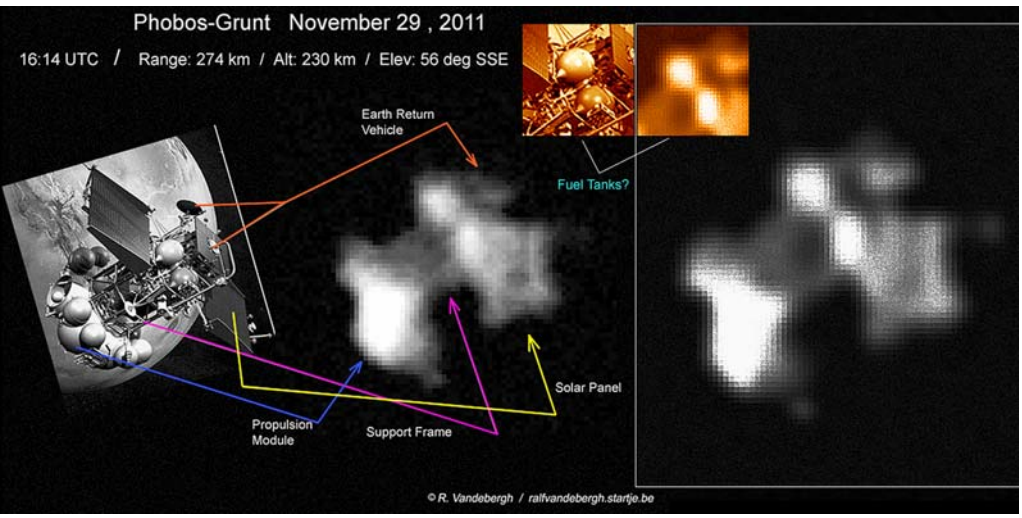

Figure 1. ***Phobos-Grunt*** **imaged in Earth orbit on 2011 Nov 29 compared with a library photograph. 254mm refl., *R. Vandebergh*.**

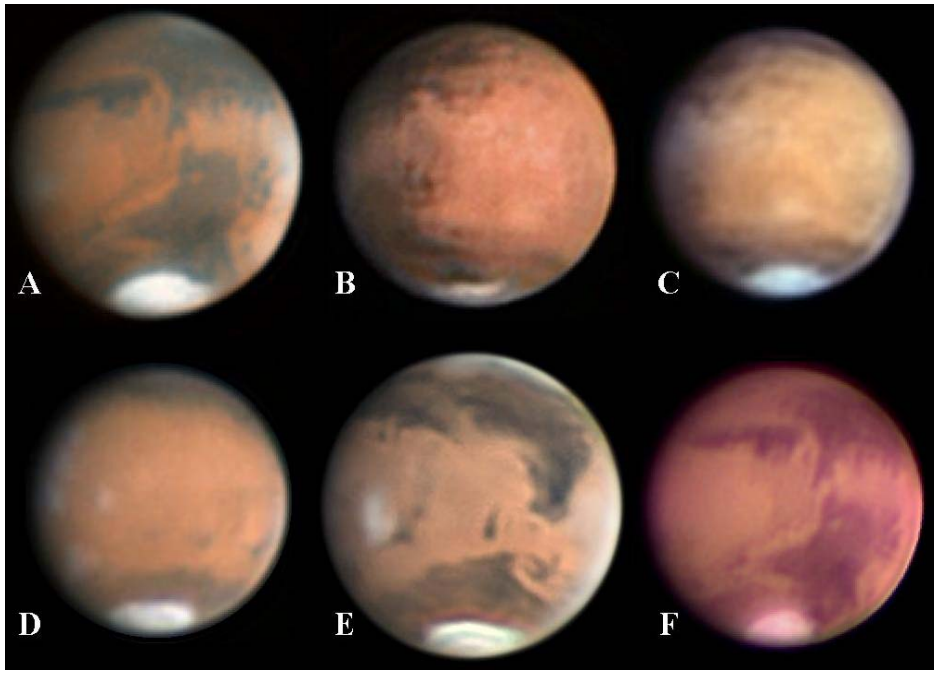

Figure 2. Recent images of Mars. (South is uppermost.) (A) 2012 Jan 17, CML= 003°, R(G)B image, 356mm SCT, *D. A. Peach*. (B) 2012 Feb 11, CML= 084°, RRGB image, 279mm SCT, *J. Sussenbach*. (C) 2012 Jan 26, CML= 106°, RGB image, 279mm SCT, *T. Kumamori*. (D) 2012 Jan 21, CML= 158°, RGB image, 405mm Dall–Kirkham, *S. Buda*. (E) 2012 Feb 3, CML= 254°, RGB image, 410mm refl., *D. C. Parker*. (F) 2012 Feb 7, CML= 359°, RGB image, 410mm refl., *T. Barry*.

Observations of Mars in 2011–'12 before opposition

Prospects for this apparition were reviewed by the Director in the 2011 October *Journal*.[1] By 2012 mid-February observational work was to hand from 42 contributors: see Figure 2.

The usual seasonal phenomena have been witnessed, including the transition from north polar hood to polar cap. The large cap was very prominent in late 2011, and it showed a rather prominent annular rift as well as some bright patches. The usual separation of *Olympia* from the cap has been witnessed very recently, while the best images of Feb 11 and 12 were the first clearly to reveal a small dust storm around longitudes 160–170° above the fragmenting cap, and close to its edge. The dust appeared darker than the NPC, but was lighter than the cap's surroundings, over which the dust propagated. The activity can be traced further back for several days; the data to hand will permit a complete account of the event to be written later.

Meteorology has been recorded by many observers, including the usual orographic clouds over the *Tharsis Montes* and *Olympus Mons*. The surface features look to be nearly identical to the 2010 opposition, but there are a few small changes to be caught if one looks very carefully. In particular, there is a slight fading and shrinking of the long-enduring dark patch in *Aetheria*, which is located at the NW corner of the *Elysium* shield. (This marking is sometimes called the *Hyblaeus* development.) Compare these images with those from 2010 in the issue of the *Journal* cited above.

We intend to produce another Interim Report later in the apparition.

Richard McKim, *Director*

1 R. J. McKim, *J. Brit. Astron. Assoc.*, **121**(5), 258–259 (2011)