

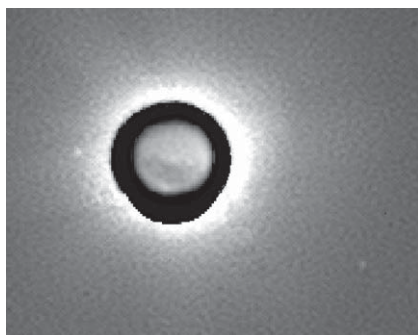


## September moons

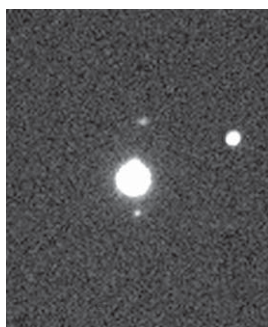
Although Mars, through unprecedented proximity, caused great interest in its surface features this summer, its two tiny moons were worthy imaging targets too. A few degrees away was Uranus with Oberon and Titania and further west Neptune and satellite Triton.

### Mars

The proximity of Mars proved a good opportunity to observe the two tiny satellites Phobos and Deimos as their apparent distance from the planet would be at a maximum. Nevertheless it was a severe challenge with the satellites some 12 to 13 magnitudes fainter than Mars itself and never far from the planet's glare. Even at maximum elongation the brighter, inner satellite Phobos is only a planet's width from the martian limb. I used *Redshift* software to predict such favourable occasions, usually timed when both satellites were well clear of the planet's limb to be recorded hopefully in a single frame. Initially I devised the classic method of an occulting bar, i.e. a short focus camera lens within a tube to image a 1mm wide pin onto the CCD with the disk of Mars hidden behind the pin's silhouette. Outer satellite Deimos was recorded but the additional optics introduced more glare and were discarded in favour of using the CCD without impediment and hoping its dynamic range could cope. It appeared to do so with a correct exposure of about 5s with my set-up using a  $\times 2$  Barlow lens before the CCD camera to increase the telescope focal length to 6m. Mars was



Mars with Phobos (left) and Deimos (right). 2003 September 17, 00.34 UT. 300mm SCT at f20 + MX9 CCD; 5 secs exposure. Mars itself superimposed – scope stopped to f120, 1s. exposure. The background mottling is an artefact of the image processing. *M. Gavin*



Uranus with Oberon (top) and Titania (bottom), 2003 September 12, 22.40 UT. 300mm SCT at f10 + MX9 CCD; 60s exposure. The field star is GSC 5806:1424, mag 11.1. *M. Gavin*

grossly over-exposed and superimposed later from an image taken during the same session with the telescope stopped down.

### Uranus

Uranus was a few degrees north-preceding Mars and within the same binocular field. The outer satellites Oberon [mag 14.1] and Titania [mag 13.9] are relatively easy to record. Umbriel and Ariel are progressively more difficult, being fainter and nearer to Uranus, and were not recorded on this occasion.

### Neptune

Remote Neptune was some 24 or so degrees west of Mars and curiously its brightest satellite Triton is the easiest of these satellites to



Neptune and Triton, 23 hours apart. 2003 September 17, 22.52 UT (left) and Sept. 18, 21.51 (right). 300mm SCT at f6.3 + MX9 CCD; two 60s exposures merged. *M. Gavin*

record at mag 13.5 – some 6 magnitudes fainter than Neptune. The field is a composite of two exposures taken 23 hours apart showing Neptune's westerly motion with attendant Triton. Neptune, like Uranus, appears grossly enlarged in these exposures. North is 'up' in all images. See more satellite images via my homepage <http://www.astroman.fsnet.co.uk>.

**Maurice Gavin**

## A new nova in Messier 31

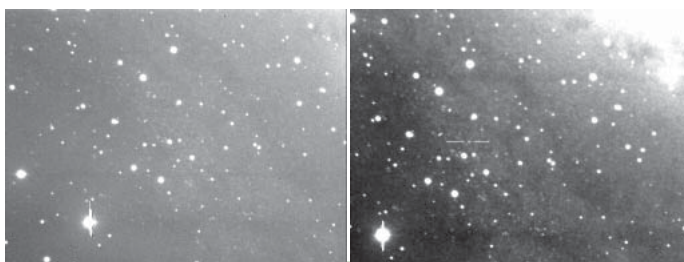
In addition to his amazing run of supernova discoveries in distant galaxies, Tom Boles clearly has need of yet more target objects and has recently 'strayed' into searching M31, the nearby Andromeda spiral.

Naturally there is always the possibility of finding a supernova in the Andromeda Galaxy and indeed in 1885 Ernst Hartwig of Dorpat Observatory in Estonia noted a 'new star' there. Initially it was described as a nova, but much later was a key factor in reassessing the distance to M31, which resulted in the object being re-classified as a supernova.

On 2003 September 17.15 UT, Tom noted a new object of magnitude 18.1 in M31 in unfiltered CCD images using a 0.35m Schmidt-Cassegrain telescope during searches for the UK Nova/Supernova Patrol. Follow-up images by way of confirmation were obtained on Sept 20.05 UT by Tom himself and also by Odd Trondal of Oslo, Norway, on Sept 20.12 UT using a 0.25m reflector and CCD. The new object is located at RA= 00h42m59s.84, Dec.=

+41°03'33".9, which is approximately 175" east and 755" south of the centre of M31 although, as usual in such cases, the accompanying images give a clearer identification.

It was quickly established that the suspect could not be seen on Tom's images of



Master image (left) and Tom Boles' discovery image of the nova in M31.

2002 Sept 28 (limiting magnitude 20.0) and 2003 August 2 and 31 to a limiting magnitude of 19.5. Further there was no evidence of it being recorded on Palomar Sky Survey red (1989.749) or blue plates (1989.686). The discovery was announced on IAU *Circular* 8205 issued on September 20.

Tom adds that he has been searching M31 with a blinking technique using *AstroArt* software. Although slow for general supernova checks, busy fields like M31 and nova patrols with crowded star fields benefit from this technique. Recently he applied a gradient filter (in *AstroArt*) which turns stars into 'little 3D peaks' as well as blinking, but more ▶

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**New nova in M31 – continued...**

► importantly lets him see closer to the nucleus where everything is often burnt out. However for this particular discovery the new object was quite clear of the centre and relatively easy to spot. Tom would like to express his appreciation to Weidong Li from the LOTOSS partnership who kindly reviewed his images and gave advice before he reported the object.

This success will hopefully encourage others to carry out searches in M31 and similar ‘nearby’ galaxies both for supernovae and novae. Further details of any aspect of the work of the UK Nova/Supernova Patrol can be obtained from the undersigned.

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**Guy M. Hurst**, *Coordinator, UK Nova/Supernova Patrol*