

Observing Report for 2nd February 2014

On the evening of Saturday 1st of February there was predicted to take place a transit and a shadow transit of Jupiter's largest moon Ganymede, (the largest moon in the solar system), across the cloud belted face of the giant planet. The entire track of the transit would be visible during the hours of darkness and conclude before midnight GMT, and also before Jupiter got low down in the sky and passed out of sight behind the trees to the west of the observatory. I initially wanted to organise an observing session, and lead a group of LDAS members in watching this event, along with studying the cloud features on Jupiter itself, up at the observatory at Standalone Farm that evening. I announced this plan during my Stellarium talk at the main meeting on Wednesday evening. However, there was a dismal weather forecast after the BBC TV news late on Saturday afternoon. I saw from the animated cloud graphics for the whole of south eastern England, that there would be cloud and long periods of rain throughout the entire night, and therefore little chance of doing any astronomy during the hours of darkness. So I concluded that there was no choice but to abandon the whole endeavour.

Then, at about 18:00 hours, I received a telephone call from Kathy Hall who informed me that according to the most recent BBC/Met Office online weather forecast for the North Herts area, there would be "broken cloud" and "clear periods" during the early hours before sunrise on Sunday morning, 2nd of February. Soon after this I called Richard Stratford who confirmed this prediction with a quick look at his online forecast at home. So it was on; at least for the early pre-dawn hours anyway. But, of course, Jupiter and its moons would be out of sight behind the trees by that time of night. So observing that was ruled out.

Another piece of fascinating astronomical news that I read in the previous week's LDAS newsletter was that a bright new supernova had appeared in the bright galaxy M82 in Ursa Major, the Great Bear. As if that wasn't enough, I was then informed at the previous Wednesday's LDAS meeting that there were two other recently discovered extra-galactic supernovae; one in the galaxy M99 in Coma Berenices and the other, (much fainter one), in the galaxy NGC3448, also in Ursa Major. All these parts of the sky containing these three galaxies are above the horizon throughout the night at this time of year; so it didn't matter what time of night you might get a clear sky in order to be able to observe them.

Before driving over to Hitchin to collect Richard and Kathy that night, I drove over to Standalone Farm, while the sky was still overcast, to do some tidying up work up at the observatory. I cleared out a lot of spare wood and left over building materials that were cluttering up the observatory and put it all away in the new storage shed. I also took two small portable telescopes out from the blue cupboard and put them in the shed as well, so that they were ready to be hired out to any beginners wanting to try them out. Then, at just before 03:00a.m GMT, I locked up the observatory and the shed, and went to pick up Richard and Kathy. The sky was still overcast at this time, but at least the rain and drizzle had completely stopped.

I returned to the observatory with my two dedicated companions at 03:40am, and together we had the roof down and the 14inch telescope up and running by just after 04:00am. During this time, as if by magic, large breaks had appeared in the clouds above. By about 04:15am the sky was more than 80 per cent clear, and I used the bright orange star Arcturus in Bootes to align the computerised GOTO system on the telescope with. Immediately after that I moved the telescope onto the Red Planet Mars, which was just a few degrees north of the bright white star Spica in Virgo. Using my Meade 24.5mm Super Wide Angle eyepiece, giving a power of x145, we could make out a white polar ice cap on Mars' north pole and some delicate dark markings on the ochre tinted disk. I raised the magnification to x284 with my Celestron 12.5mm Super Plossl and this made the surface features even easier to see. There seemed to be one dark area in the northern hemisphere and another, a bit further to the east, in the southern hemisphere. Together these two markings looked a lot like the outlines of the two continents of North and South America on a globe of the Earth. Anyway, knowing sunrise to be not too far off, we didn't spend too much time scrutinizing Mars; we had some supernovae to hunt down.

With the computerised handset I used the GOTO system to turn the telescope swiftly onto the galaxy M82 in northern Ursa Major. M82 is sometimes called ‘the Starburst Galaxy’ because of the prodigious amount of intense star formation that is going on throughout its entire galactic disk. Together with M81, or ‘Bode’s Galaxy’, and a faint dwarf catalogued as NGC3077, all three galaxies are enveloped in a vast cloud of neutral hydrogen gas, and lie at a distance of about 11 million light years away. The computer was a little off, when I looked through the Meade SWA eyepiece, M82 was just outside the field of view, so I had to manoeuvre the ‘scope a little to centre it in the field. The sight of Supernova 2014j was absolutely awesome and breathtaking. I can honestly say that it is the brightest supernova I have ever seen, not by a little, but by a very wide margin, to any I have ever seen previously. It lies exactly where David Davies’ and Malcolm Crabbe’s images in the January newsletter show it to be; which is along the central plane of the galaxy, but out to one side away from the nucleus, about halfway out towards the tip of this cigar shaped irregular galaxy. Together, the three of us estimated the supernova’s brightness to be about magnitude 8.0 (*yes eight!*). It was also showing a very noticeable red tint. This is being caused by a great deal of interstellar ‘reddening’ by huge clouds of nebulae, or HII regions, within M82 itself. I don’t know if this peculiar colouration has yet been captured in any images currently being taken of the supernova. Apparently the spectrum and light curve so far has revealed it to be a type Ia supernova, which is an exploding white dwarf in a close binary system. Using my 16mm Tele Vue Nagler eyepiece, I raised the magnification to x222 for an even closer look at this cosmic spectacle. Through an eyepiece producing an 82 degree apparent field with such amazing eye relief, it looked even more superb. As for M82 itself, we observed that it is a lumpy sort of cigar shape and very ‘blotchy’ in appearance, with a very noticeable dark ‘pinch’ on both sides of the nucleus. There is also a hint of star like ‘speckles’ over most of its uneven light which can be glimpsed with averted vision.

You might think that after seeing all that, any other supernova and its host galaxy would be a bit of an anti-climax; but not so! After doing a quick GOTO on the second magnitude star Beta Ursae Majoris, or Merak, I scanned a few degrees south of it, just south and east of the star 44 Ursae Majoris, to quickly locate NGC3448. This spindle shaped galaxy is smaller and a lot fainter than M82. So was its supernova. At first I couldn’t see any obvious sign of a vast stellar explosion, but after much staring and using averted vision, I caught sight of a very faint but obvious ‘dot’ of light on the very tip of the galaxy. When I told Richard that I could finally see something, he remarked that on the tip of the galactic disk is exactly where it appears on discovery photographs that he had recently seen on the Internet. I estimated its brightness to be about magnitude 12. This is not the sort of thing that any visitor or non-astronomer would notice if taking a casual look through a telescope at a star party, but the three of us, with our trained eyes and brains, could definitely see it once we knew the precise spot to focus our minds on. It appears from the spectrum that this is a type II supernova, which is a solitary supergiant star blowing itself to pieces. Although faint and challenging, we found supernova 2014g a fascinating and intriguing sight nonetheless.

At about 05:15am we noticed that the planet Saturn had risen high enough above the south eastern horizon to be plainly visible to the naked-eye. It lies in the centre of the constellation of Libra, a few degrees east of the bright stars Alpha Librae, or Zubenelgenubi, and Beta Librae, or Zubenelschemali. As Kathy and I gazed at Saturn together, we saw a bright iridium flare appear just above it. Lasting only a couple of seconds or so, it had a very short trail before disappearing again. I thought that this must be a perspective effect caused by its low altitude in the sky as seen from our location. Richard had missed it completely as he was still busy looking at NGC3448 through the telescope.

The third supernova and host galaxy lay much further south, in the constellation of Coma Berenices, which borders onto Leo and Virgo. M99 is a face on spiral galaxy near to the fifth magnitude star 6 Comae. It was during this time, at about 05:40am, that a lot of hazy white cloud started drifting across the entire southern half of the sky. This became a bit of a nuisance as the galaxy kept fading and disappearing and then re-appearing and disappearing again through continually varying amount of hazy cloud. In the clearest gaps we think we saw supernova 2014l just off to one side of the brighter nucleus and in the main galactic disk. It was about magnitude 10 or 11 I'd say. We also had a very quick look at the nearby galaxies M98 and M100 before they too were totally blotted out by the clouds, and we were forced to give up.

After this we made an attempt to try and track down a comet. Richard brought some charts with him which showed Comet 2012 X1 LINEAR to be a couple of degrees north west of the fourth magnitude star 66 Ophiuchi in the constellation of Ophiuchus, the Serpent Bearer, that morning. It was as bright as magnitude 7, so I thought that it would be a piece of cake. However the clouds had other ideas. So, after much cursing at not being able to see anything but bright stars through the murky skies, I was forced to abandon the search.

Doing another GOTO, I manoeuvred the telescope swiftly onto the ringed planet Saturn because it has a bright planetary disk which was bright enough to shine through much of the annoying hazy cloud. By this time in the pre-dawn hours Saturn was at its highest point on the southern meridian. Even through thickening cloud we could see the planet's pale yellow disk and glorious system of rings, which are now nearly fully wide open as seen from Earth.

But there was even more to see after this. By about 05:50am there was a thin sliver of completely clear sky low above the south and eastern horizons, and it was here that Richard and Kathy first caught sight of the rising planet Venus with their binoculars. It was low in the south east and a dazzling sight to the naked-eye. I put the telescope onto it. Through my Meade SWA eyepiece again Venus showed a thin crescent phase, large in size but shimmering and boiling about madly in the poor seeing of the Earth's atmospheric turbulence.

At about 06:00am the whole sky was being almost completely obscured by cloud. We did manage to have another look at Mars and Saturn again, through thinner patches of cloud and using my 12.5mm Celestron Super Plossl eyepiece giving a higher magnification of x284. But this was all very brief. By 06:20am the cloud was total, and, with little hope of it clearing again soon, we decided to call it a night and closed up the observatory to go home.

As we walked back down the gravel trackway in the brightening dawn, we noticed in the crepuscular light that something peculiar had happened to it. All that rain we have been experiencing throughout January has caused a massive landslide of watery mud to run right along its entire length; all the way back down the slope to the gate. Beneath our feet it looked like we were walking along a dried up river bed. Despite the weather, the mud and the short observing 'window', it had been a thoroughly satisfying observing run nevertheless.

Robert Townsend.

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