



Deep sky

A spectacular pairing in Ursa Major



M81 (left) and M82 (right) by Bob Winter. Imaged from Wales. Sky 90 refractor and SXVH9 CCD camera. 7 min each LRGB + 7 min OIII and H-alpha.

One of the most magnificent pairings of contrasting galaxies visible in small telescopes must surely be M81 and M82 in Ursa Major – the irregular galaxy M82 visible as a slightly curved bright thin streak and the grand spiral M81 as a large diffuse oval patch with a bright condensed nucleus. Circumpolar from latitudes above 30° north, they are at their best in late winter or early spring when almost overhead. Although both galaxies have Messier designations, and were observed by him in February 1781, they were discovered some years earlier by the German astronomer Johann Bode in 1774 observing from Berlin.

The galaxies are part of the M81 galaxy group which lies around 12 million light years away. After the Sculptor Group this is the closest group to our own Local Group and includes among its members NGC 2403 in Camelopardalis and the interestingly named Coddington's Nebula – IC 2574. Quoted distances to galaxies are notoriously unreliable and the figures to M81 and M82 vary widely in the literature, with some references putting them a mere 150,000 light years apart and others putting M82 several million light years further away. Radio measurements, however, indicate that the galaxies are interacting and have a common gaseous envelope of neutral hydrogen which also covers NGC 3077 and some nearby dwarf galaxies, thus suggesting that the galaxies lie relatively close together.

Fitting inside a one degree field, M81 and M82 have always been popular amateur targets and feature regularly in material sent to the Deep Sky Section. Recent observations have been submitted by Ron Arbour, Bob Garner, John Gionis, Peter Howard, Nick

James, Simon Johnson, Gordon Rogers, Bob Winter and Chris Woodcock. Images reproduced here showing the two galaxies in the same field are by Nick James, using a remotely operated telescope in New Mexico, and Bob Winter, imaging from rural Wales.

Both M81 (RA 9h 55.6m, Dec +69° 04') and M82 (RA 9h 55.8m, Dec +69° 55.8') are easily visible in small binoculars, and there are reports of M81 (visual magnitude 6.9) being seen with the naked eye from dark mountain top sites. On a good night, and with averted vision, a 25–30cm telescope will give hints of the spiral arms, but the main visual impression will be of a diffuse 15×8 arcmin milky halo with a very bright central nucleus. Larger telescopes will show more detail and give a better hint of the spiral arms, but this is not a galaxy that shows its arms well to the visual observer. The image of M81 by Bob Winter on the front cover, also taken from Wales, confirms that these arms are not as prominent as on many spiral galaxies.

The contrasting edge-on galaxy M82 is slightly fainter than its companion (visual

magnitude 8.4 but smaller in size and therefore of similar surface brightness) but shows much more detail visually, appearing as a beautiful mottled 10×3 arcmin cigar shape, cut through by dark lanes. While M81 appears now to be a relatively placid galaxy with few active star forming regions, M82 is the exact opposite. Recent high resolution images, particularly from the Hubble Space Telescope (HST) and WIYN telescope on Kitt Peak, Arizona, have shown huge outflows of ionised hydrogen gas extending over 10,000 light years into space from the centre, driven by active star formation within the galaxy's core – star formation thought to have been triggered by a close encounter with M81 some 300 million years ago.

This gas emission is very clear in the superb image of M82 by Gordon Rogers shown on the cover, taken from his observatory in Long Crendon, Bucks. In addition to exposures of 50 minutes of luminance and 80 minutes each of RGB, the image includes 220 minutes of H-alpha exposure.

When you next observe these two galaxies, just take a moment to ponder the turmoil that is taking place at the heart of this slender curved streak of light. It is a sobering thought.

Stewart L. Moore, *Director, Deep Sky Section*



M81 (left) and M82 (right) by Nick James. Image acquired remotely from GRAS, Mayhill, New Mexico using Takahashi TOA 150 refractor and SBIG 5T-L-11K CCD.

Comet 17p/Holmes in 2007



Images of Comet 17P/Holmes by BAA observers.

Top: 2007 Oct 28, 100mm refractor f14, Canon 350D, 60sec, ISO800: [David Arditti](#).

Middle: 2007 Nov 3, 245mm Newtonian f6.3, Canon 300D, 15×20s: [Martin Mobberley](#).

Bottom: 2007 Nov 11, 203mm SCT f6, Canon 30D, 34sec, ISO1600: [Charles Calia](#).

Right: 2007 Nov 20, 300mm lens f2.8, Nikon D100, 90sec, ISO340: [John Vetterlein](#).

A circumzenithal arc



A circumzenithal arc over the Statue of Liberty, New York, USA. 2007 November 24 at 18:52 UT, with the Sun at an altitude of 22°. [Nick James](#).

