NGC 4565 – a stunning galaxy in Coma Berenices

Gordon Rogers

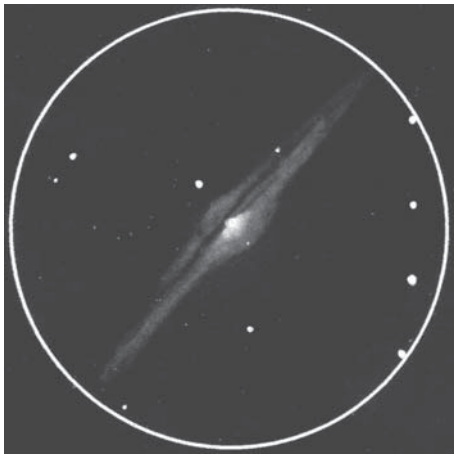
Midnight in April sees the constellations of Coma Berenices and Virgo lying due south and tempting telescope owners to explore the mass of galaxies that lie within their boundaries. I still recall Owen Brazell and myself getting hopelessly lost in Virgo from Tenerife in 2007 with a 25-inch Dobsonian. From 2,300m altitude, and under a good sky, every nudge of the telescope brought yet more galaxies into view – the vast majority showing great structure and detail. Unfortunately, from the UK Virgo does not rise particularly high and often resides in a region of haze and light pollution. Luckily neighbouring galaxy-rich constellation Coma Berenices culminates at a more respectable altitude and, in addition, contains one of the most beautiful galaxies in the whole sky: NGC 4565, commonly known as the Needle Galaxy.

Galaxies come in all shapes and sizes but largely the view we have of them depends on their orientation relative to our line of sight, from face on, as with M101, to edge on, as with NGC 891 (see Observers' Forum **121**, 5, 2011). Seen visually there is probably nothing more impressive than an edge-on galaxy complete with a rippled dust lane filling the field of view of a large telescope, and NGC 4565 is one of the most impressive in this respect. The galaxy was discovered by William Herschel in 1785 April, although it could easily have been found by Messier or his co-workers. Herschel catalogued it as no. 24 in his class V objects – very large nebulae. He described it as a lucid ray 20' long and 3' or 4' broad and having a beautiful appearance. This was also a sentiment shared by Lord Rosse who observed it with the great 72-inch Birr reflector in 1855 April.

NGC 4565 is located at RA 12h 36.3m and Dec +25° 59' (2000.0) which puts it 3.2° SE of mag 4.4 γ Comae and directly on a line between α and γ. Coma is a very star-poor constellation and α (Diadem), its brightest star, only has a magnitude of 4.3. NGC 4565, which is estimated to lie at a distance of approximately 35 million light years, is part of the Coma–Sculptor cloud of galaxies. It has a length around 130,000 light years, an estimated mass of 11 billion suns and is thought to be a barred spiral. Through the eyepiece it is elongated NW–SE and appears as a 15' or longer streak of light with a thickness of around 1.5' growing to a 3' central bulge and with a conspicuous dust lane along its length; although these dimensions and the amount of detail visible obviously depend on the aperture of the instrument being used. However, even in a 150mm reflector the galaxy can be a stunning sight under a transparent sky with the dust lane quite obvious.

Dale Holt combines visual observing with electronic detection and his drawing of the galaxy shown here was made from his observatory in Chipping, Hertfordshire using a 505mm Newtonian fitted with a Watec 120N video camera. The bright central bulge, and the dust lane to the north-east of the core which runs the length of the galaxy, are clearly shown in his drawing. In addition to being a popular visual target the galaxy, not surprisingly, also appeals to imagers and photographs have been received from Gordon Rogers, Bob Garner, Peter Carson, Andrea Tasselli, Paul Whitmarsh and Paul Downing.

Paul Whitmarsh observes from Uckfield, East Sussex and his 2008 February image shown here was shot through a Williams Optics 110mm f/6.5 refractor with MX916 CCD. The 6×10min exposure used an IR blocking filter. This wide field view gives the interesting impression that the ▸



Dale Holt

Paul Whitmarsh

Peter Carson

Aurora at Tarbat Ness

Denis Buczynski writes: A strong auroral display was seen here at Portmahomack [Ross-shire] on 2012 February 18/19. An arc was seen around midnight which began banding with some rays until around 01:00, then it quietened. Activity increased again after 01:30 and many rays and curtains were seen. After 02:45 strong red rays were seen and these continued until 03:30. There was a lot of snow shower cloud around and one heavy snow fall stopped observations for a while. The wind was a very cold westerly and the temperature was well below zero... These images were taken with a Canon 400D and a 28mm lens at f/2.8 at ISO800. *Left:* 02:53 UT, 28 sec exposure; *below:* 03:23 UT, 33s.

galaxy has cleared all the bright field stars from its immediate vicinity. Several other galaxies are visible in the image, the brightest being magnitude 14 NGC 4562 which lies 13' to the SW and appears at right angles to NGC 4565. Peter Carson's image was taken from the Kelling Heath spring star party in 2007. Peter used a Tele Vue NP101 f/5.4 refractor and HX916 CCD. This LRGB image (60min L, 20min each RGB) encompasses a slightly wider field than Paul's.

Gordon Rogers' stunningly detailed image was taken in 2004 from his observatory in Long Crendon, near Aylesbury, Bucks., with his 16-inch (406mm) Ritchey–Chrétien telescope fitted with adaptive optics and ST10XE CCD. The LRGB exposure was 80min L and 20min each RGB.

Whatever instrument you observe or image with, if the constellations of Virgo and Coma feature on your target list for the coming spring then do make time to observe this galaxy: you will not be disappointed.

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

Remote observations of supernova 2011fe

The discovery by the Palomar Transient Facility on 2011 August 24 of supernova (SN) 2011fe/PTF 11kly shortly after its eruption in Messier 101, has provided a further opportunity to observe the development of a SN event using the NASA MicroObservatory Robotic Telescope Network (see the 2011 October issue of the *Journal*, p313, for a description of earlier observations of SN 2011dh in M51). Quickly identified as a young Type Ia SN, the brightest and most energetic kind of stellar explosion, and with the potential to be the brightest SN in nearly 20 years, the event attracted considerable media coverage and interest from amateur observers.

M101, the Pinwheel Galaxy in Ursa Major, is one of 14 galaxies that can be requested to be observed by the robotic telescopes of the MicroObservatory through the *Observing with NASA* webpage (**http://mo-www.harvard.edu/OWN/**). Following the announcement of the discovery of the SN, the author requested nightly observations of the galaxy and a total of 41 unfiltered CCD images were successfully acquired, together with archive images of the galaxy acquired on 3 nights prior to the event (see Figure 1 for representative pre- and post-eruption images). For each useable image, the magnitude of the SN was determined using *AstroArt 5.0* and differential ensemble photometry based on 10 nearby comparison stars with V magnitudes derived from the *Guide Star Catalog*.

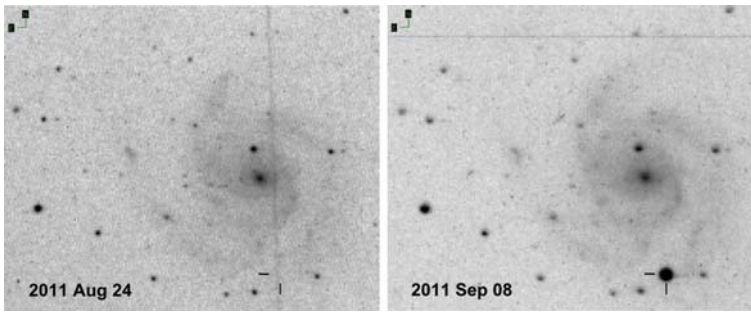


Figure 1. Pre- and post-event unfiltered CCD images of Messier 101 acquired by telescopes of the MicroObservatory Robotic Telescope Network. The location of SN 2011fe is shown by tick marks. The vertical line on the left hand image most likely results from a satellite in low earth orbit, whereas the horizontal line on the right hand image is a defect in the CCD sensor.

The resulting lightcurve covering the first 53 days after the explosion (Figure 2) visibly shows the development of the SN event. Prior to the

explosion, the location of the event in the spiral galaxy had a magnitude of the order of >16 and brightened quickly over the course of 16 days to an estimated peak magnitude of 9.9 on 2011 September 9.62. The SN then dimmed linearly at a rate of approximately 0.053 magnitudes per day before eventually reaching mag 11.9 by the end of the current set of observations on 2011 October 16.

Based on a distance to M101 of approximately 21 million light years (6.4Mpc), the peak absolute magnitude of SN 2011fe was calculated to be –19.1. This is nearly 7 times brighter than the earlier SN 2011dh event, which had an absolute magnitude of the order of –17.0.

Robotic observations of M101 continue to be requested by the author on a nightly basis in order to further characterise the development of the SN's lightcurve and to assess the utility of the MicroObservatory for observational studies. In due course it is hoped to submit a formal description of the observations of the two SNe for consideration for publication in this *Journal*.

Martin J. F. Fowler

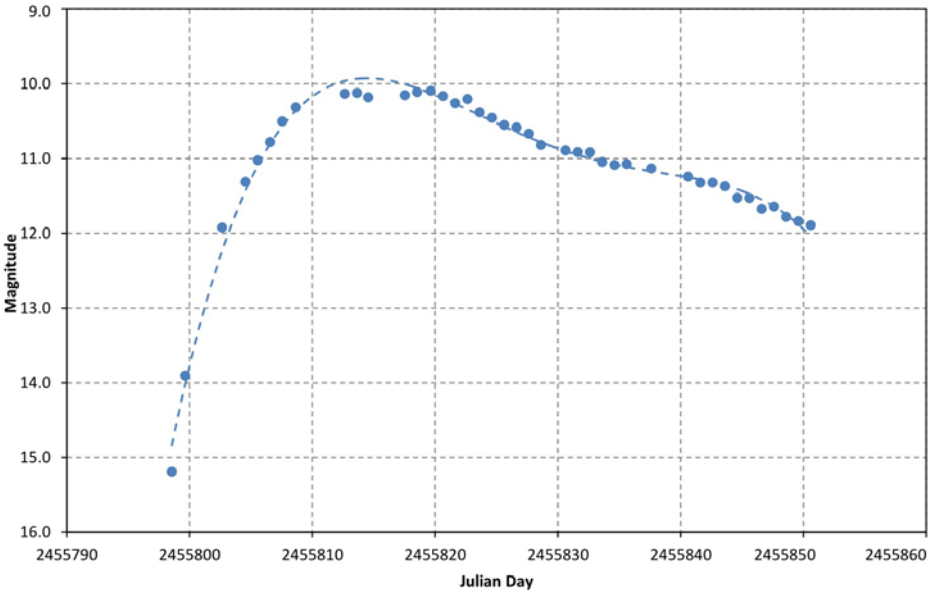


Figure 2. Unfiltered lightcurve of SN 2011fe as determined from images acquired by the telescopes of the MicroObservatory between 2011 August 25 (JD 2455798.5) and 2011 October 16 (JD 2455850.5).