

Ordinary Meeting, 2005 October 26

held at The Geological Society, Burlington House, Piccadilly, London W1

Richard Miles, President

Ron Johnson, Hazel Collett and Nick James, Secretaries

Dr Miles opened the first meeting of the 116th session, expressing his congratulations to his predecessor, Tom Boles, for having seen the Association through two years of rapid change, including a complete change of staff in its Office, and the installation of a new computer system. He expressed the hope that Mr Boles, with the time commitments of running the Association passed, would now be able to devote more time to his eyepiece and to his excellent supernova patrol work. He then invited Mrs Hazel Collett to read the minutes of the last meeting of the previous session, which were approved by members and duly signed.

Mr Ron Johnson, Business Secretary, was then asked whether any presents had been received by the Association since the previous meeting; it was reported that there had been two books: *Fifty Golden Years 1954 – 2004*, donated by the Aryabhata Research Institute; and *The Stargazing Year*, by C.L. Calia, donated by its author. Members applauded the donors.

The President announced that there were 46 new members proposed for election; the election of those 82 who had been proposed at the previous meeting was approved by members, and they were duly declared elected. Dr Miles welcomed any newcomers to introduce themselves at the end of the meeting. Mr Nick James, Papers Secretary, reported that Council had approved six new papers for Journal publication:

Performance of a Fibre-Optic Coupled High Resolution Spectrograph with CCD Camera Data Recording of Solar Absorption Spectra, by David Airey

A Home-Made Newtonian Filter Holder for Planetary Imaging, by Martin Mobberley

The Visibility of the Dark Side of Venus 1921-1953; A Series of Observations by M.B.B. Heath, by Richard Baum

The Perseid Meteor Shower in 2002, by Neil Bone

A Small-Aperture Telescope Detection of the Radial Velocity Variation of τ -Boötes due to the Orbital Motion of the Substellar Companion, by Sigfried Vanaverbek

Observations of the Recently Discovered Dwarf Nova 1RXS J053234.9+624755 During the 2005 March Superoutburst, by Jeremy Shears

Dr Miles announced that the Association's next meeting would be the Northern *Back To Basics* Workshop, to be held in Doncaster on Saturday November 12. The following week, there would be a meeting of the Instruments & Imaging Section on November 19 in The Humfrey Rooms, Castilian Terrace, Northampton. The next Ordinary Meeting would be the Christmas Meeting, to be held in the English Heritage Lecture Theatre on the afternoon of Saturday December 17; the Christmas Lecture would this year be delivered by Prof Don Kurtz, and would be followed by Rod Jenkins and Martin Mobberley.

The President then welcomed Nick James to make a short presentation of images on behalf of all those who had observed the annular solar eclipse of October 3.

Eclipse Observations

Mr James opened by giving the circumstances of the eclipse, which had been visible in its annular phase along a path which traversed Spain, Portugal and parts of Africa; it had started at 08:55 (09:05) UT in Portugal (and southern Spain), and lasted 4m10 (4m20). A partial eclipse had been visible from London between 07h49 and 10h19 UT, to a maximum of 66.1%.

The speaker, and a number of other Association members, had taken advantage of cheap airfares to fly to Madrid for a long weekend, and had viewed the eclipse from Valencia. Others had observed from Tunisia, while many others still, of course, had watched the partial event visible from the UK. Spain had enjoyed clear skies throughout; the Tunisian groups had had some worries about localised cloud patches, but in the event they had not affected anyone of whom the speaker was aware. Many in the UK had been clouded out, though there had been some clear patches, especially in the south-east.

Martin Mobberley, in Suffolk, had imaged some of the partial phase through a thin veil of cloud; in Worcester Park, Maurice Gavin had had good enough skies to take a series of images, later to be stacked into a fine composite, which revealed clearly the magnitude of the eclipse. In Surrey, John Murrell had taken another fine series of images by mounting his digital SLR onto the back of his telescope.

Mr James then showed some of the images from Valencia – firstly those by Damian Peach and David Tyler, taken

during annularity. The resolution achieved was astounding – some aspherical details were even apparent on the lunar limb. The speaker was unsure whether these were lunar mountains, as he might like to believe, or seeing effects; in either case the images remained superb. Pete Laurence had obtained a fine image of the central moment of the annularity, when the Sun had appeared to form a perfect ring. Perhaps the best images of third contact were those by Glyn Marsh, who had captured the annulus breaking up into a whole series of many Bailey's Beads; these were without question the result of lunar topography, the Sun setting first behind the mountains, lingering a little longer above the valleys, each for a moment like a sparkling bead until solar limb crept beneath their floors also.

In Tunisia, Nigel Evans had attempted successfully to take a composite image of the eclipse, using film rather than digital stacking – the old-fashioned way. A fair amount of advanced planning had been required, to frame the shot appropriately and select a suitable exposure; the speaker congratulated him heartily: he had good reason to be pleased with the result.

Mr James concluded by showing a video that he had taken from Valencia of the annular phase; he also remarked upon one of the most interesting demonstrations that could be done during the partial phases of an eclipse: projecting little crescent images of the Sun through little pin-holes and other crevices.

Following the applause for Mr James' display of images, the President then introduced the evening's final speaker, Dr Stewart Moore, Director of the Deep Sky Section, to discuss the objects which would be visible in coming months.

The Autumn Deep Sky

Dr Moore remarked that his talk would provide a striking contrast to Mr Boles' earlier Presidential Address: whereas the supernova patrol work described there had been at the cutting edge between amateur and professional work, the present talk would contain a lot of pictures, showing some of the beautiful gems of the night sky. The autumn was often thought a poor season among amateur astronomers. The winter constellations – Orion, Taurus, Gemini, etc. – rose very late in the night, while the summer constellations – those at right-ascensions closest to the Galactic Centre, including Patrick Moore's famous *Summer Triangle* – began to sink into the twilight of dusk. As for the autumn's own constellations – Andromeda, Triangulum, Aquarius, etc. – they seemed to be dominated by rather faint and unappealing stars.

But he wished to right this view, for what these constellations lacked in bright stars, they made good with a fine showing of deep sky objects. Concentrating on the vicinity of Pegasus, the speaker began to tour the sights.

Perhaps the most famous among them was the *Andromeda Galaxy*, M31, an Sb spiral, and its companions, M32, a dwarf galaxy, and M101, an elliptical. Here was a fine illustration of the gregarious nature of galaxies – a triplet separated by a mere degree on the sky. Showing a three-dimensional map of the Local Group of galaxies, the speaker illustrated how M31's relationship to its two companions was very similar to that of the Milky Way to the two Magellanic Clouds; in both cases, smaller satellite galaxies orbited around a more massive parent.

M31 itself was $\sim 3^\circ$ across, and readily visible as a misty patchy to even mediocre eyes given sufficiently dark skies. Given its brightness and size, it was an easy target to find telescopically; the star α And (aka δ Peg) provided a nearby reference for star-hopping. Through a telescope with 30' field, however, it was often a disappointment: only the central region could be seen, which seemed to merely fade away towards its edges. A good pair of binoculars generally provided a much more appealing view. The speaker's personal favourite of the trio, however, was M101 – though the faintest of the three, it was set in an attractive star-field, and its mottled core and a faint obscuring dust lane made it appear slightly spiral, despite its elliptical classification.

Despite their fame, however, Dr Moore thought that Andromeda had better sights to offer – NGC 891, for example. It was easy to locate, being 18' of right ascension to the east of mag 2 star γ And – one could simply find this star, turn off the drive, and drink tea for 18 minutes! An edge-on Sb spiral galaxy, it appeared spindle-like, with a strikingly dark dust lane running through its centre, and two mag 12-13 stars marking either end. Another nearby edge-on spiral (classified Sbc) was NGC 7640, appearing as a thin needle of light – a long thin streak of faint nebulosity with a slightly grainy core. It was a remarkable sight, but despite being quite bright at mag 11, its low surface brightness required a good sky.

The speaker turned next to NGC 7331 – a discovery of William Herschel's; Messier appeared to have missed it. An Sb spiral, it had a cluster of associated close companions, of which NGC 7335 was the brightest. Despite being a beautiful sight in its own right, it was perhaps best known as a stepping-stone to *Stephan's Quintet* – a short star-hop of around 30' to the south-west. Discovered by Frenchman Jean Marie Eduard Stephan with his 40-cm refractor from Marseilles in 1877, this latter object – five galaxies contained in a mere 5' field – was something of a historical curiosity. Four had measured redshifts in the range 5750-6750 km/s, while one, NGC 7320, measured a mere 790 km/s. Conventional cosmology would, by associating redshift with distance, place this one galaxy much closer than its "companions", and argue it to be unassociated with them; their closeness on the sky would be thought purely coincidental. However, in the 1960s, Halton Arp, amongst others, had proposed a now largely discredited view, that NGC 7320 could be seen to be interacting with its companions, and therefore must be

associated with them; he had argued, therefore, that the redshifts of objects might not measure their distances so reliably as many thought.

Moving now to the constellation Triangulum, the speaker showed the famous *Pinwheel Galaxy*, M33 – to be found 4.3° north-west of α Tri. Despite sounding rather bright at mag 5.7, it actually had a rather faint surface brightness on account of its size – at 71' \times 42', larger than a Full Moon. It was the third largest member of the Local Group, and within its sweeping spirals could be found many deep sky treats, including the bright HII region NGC 604. However, the speaker wished to draw more attention to nearby NGC 672 and its companion IC 1727 (8' distant). Both were beautiful Sb spirals, but under-observed, despite their being visible even with a mere 6" aperture. The *Pinwheel*, by contrast, could be a challenge with a 10" aperture.

As a final Messier galaxy, Dr Moore mentioned M74, though warning that it was perhaps the most difficult of all objects in the Messier catalogue to observe. A fine face-on spiral, visible as a square bright patch in lesser sky conditions, rewarded those who persevered, however. The speaker recommended fine frosty nights as the times most likely to yield the required sky conditions. He closed his summary of galaxies with NGC 253. At a declination of -25° it never rose above 14° altitude in the UK, and there was some debate as to its observability from these shores. However, this was surely unquestionable: it had been *discovered* from the UK by Caroline Herschel in 1783. Measuring 29' \times 7', and mag 7.3, it was quite bright, visible in even comparatively poor seeing. Given its declination, the windows for observation were limited, however, and the speaker recommended 10pm in late October as a good time.

Turning to star clusters, M2 in Aquarius and M15 in Pegasus were surely the finest globulars of the season, measuring 12' and 15' across respectively. NGC 7006 in Delphinus was also fine, though rather more distant – 185 thousand light-years (kly), as opposed to 30 and 37 kly for M2 and M15 respectively. Consequently, a mere 1.5' across, it was too compact to be resolved. NGC 7492 in Aquarius was also worthy of note, though at $\delta=-16^\circ$ it never rose more than 23° above the London horizon, and at 6' across, was tricky to resolve.

Cassiopeia was littered with many tens of open clusters, but surprisingly only one was a Messier – M103 – and even this a rather stubby unexciting specimen. Rather more interesting, to the south-west of the 'W', was NGC 7789 – missed by Messier and later discovered by Caroline Herschel – so often recorded in history as a mere secretary to her brother. Some had associated nebulosity, including NGC 281 / IC 1590 – the former referring to the nebulosity, the latter the stars themselves – this example being best viewed with an ultra-high contrast (UHC) filter; it appeared rather poor through an OIII filter. IC 59 and IC 63 were also good candidates for an UHC filter.

Two planetary nebulae were particularly well-placed in the autumn sky: NGC7662, the *Blue Snowball Nebula*, in Andromeda, and NGC 7094 in Pegasus. The former was visually easy and required no filter; it could be found close by galaxy NGC 7640. John Herschel had first noted it to be "blue in colour"; its nickname derived from Leyland Copeland's remarking upon its "looking like a light blue snowball". This trademark colouration was quite tricky to make out, as the eye's most sensitive cells, the rods, were colour insensitive, but it could be discerned with a reasonable aperture. NGC 7094, 1.5° away from M15, was rather harder – it was rather fainter, and greatly benefited from the use of an OIII filter. It presented all that a planetary nebula should, though: a bright shell surrounded a central star, with faint nebulosity filling the shell.

At half the size of the Full Moon, the largest, and at 0.45 kly, also the closest, of all planetary nebulae was the *Helix Nebula*, NGC 7293, which presently culminated at around 20h00 UT. At $\delta=-20^\circ$ it never rose more than 18° above the London horizon, and was easiest viewed from the Continent, but was beautiful sight through a large aperture. It could be seen through a 6" aperture, but a 12" brought out much more structure; in both cases an OIII filter was recommended.

Following the applause for Dr Moore's fine, well illustrated tour of the autumn sky, the President adjourned the meeting until December 17 at the English Heritage Lecture Theatre on Savile Row.

Dominic Ford