# The Astrophotographers' – 'A' List of Imaging Targets

| A | Image | Name | Common Name | Type | Constellation | RA | Dec | Mag. | Size |
|---|---|---|---|---|---|---|---|---|---|
| 1 |  | Ancient Site | e.g. Stonehenge, Salisbury, England. | Historical | NA | | | | |
| | | The Sun, Moon, Planets and Stars have played an important role in the religious beliefs of people for thousands of years. Many ancient sites were built to record astronomical events such as the winter and summer solstices or the movement of the moon. Such sites can be found on every habited continent. It is fitting that they should be the first item in the 'A' List. | | | | | | ☺ ☻N S 3 | |
| 2 |  | Aurora | Northern/Southern Lights. | Earth | NA | | | | |
| | | The Aurora (Borealis and Australis) are the most beautiful of all the Earth related phenomenon in the 'A' List. The ever changing shapes, patterns and colours of the Aurora justify its inclusion. It is best and most often seen from high northern and southern latitudes, and thus the imager will likely have to travel in order to capture it. | | | | | | ☻N S 3 | |
| 3 |  | B33 | Horse Head Nebula | DSO: Dark Nebula | Orion | 05:40:54 | -02:28:00 | | 8'x6' |
| | | The 'Horse Head' Nebula is one of the most famous and beautiful objects in the whole heavens. It is often considered by astrophotographer as something of a 'holy grail' – never resting until they have found it and captured, forever coming back to it to again and again in order to improve their image of it. It is also one of the most difficult of all imaging targets. | | | | | | ☻N S 4 | |
| 4 |  | C100/IC 2944 | Lambda Centauri Cluster | DSO: Open Cluster + Nebulosity | Centaurus | 11:35:47 | -63:01:11 | 2.9 | 65'x40' |
| | | The first Southern object in the 'A' List, never rising above the horizon in Northern Europe or the mainland United States. A truly magnificent object made up of the open cluster Collinder 249 and the Nebula IC 2944 lying amid the rich star fields of the Centarus Milky Way. A beginner's target bright and large, requiring careful processing the embedded nebulosity. | | | | | | ☻S 2 | |
| 5 |  | C103/NGC 2070 | Tarantula Nebula | DSO: Emission Nebula | Dorado | 05:38:42 | -69:06:03 | 4 | 30'x20' |
| | | One of the finest and most famous of all Southern Hemisphere objects – one which Northern observers would love to find in their CCD's field of view. A perfect recommendation for its inclusion in the 'A' List! It is a bright and large made even more remarkable because it is not even in our galaxy, but Is the brightest of 50 or so nebula to be visible in the Large Magellanic Cloud (LMC), situated some 170,000 light years away. | | | | | | ☻S 2 | |

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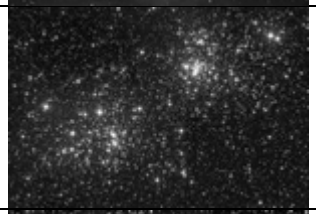
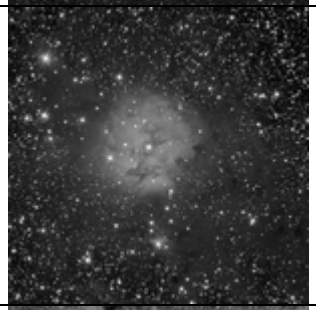
|---|---|---|---|---|---|---|---|---|---|
| 6 |  | C106/NGC 104 | 47 Tucana | DSO: Globular Cluster | Tucana | 00:24:5 | -72:04:49 | 4 | 50' |
| | | A truly magnificent object only slightly inferior in brightness to the Omega Centauri Globular (A22) by a paltry 0.05 of a magnitude, and only 10% smaller. A beginner's target because it is bright and large, but still offers a challenge in the acquisition and processing requiring accurate alignment of the LRGB images and the resolution of stars down to the core. | | | | | | ☻S 2 | |
| 7 |  | C11/NGC 7635 | Bubble Nebula | DSO: Emission Nebula | Cassiopeia | 23:20:45 | +61:12:42 | 10 | 8'x15' |
| | | A remarkable object originally wrongly classified as a Planetary Nebula and even once included in the Perek and Kohoutek catalogue of Galactic Planetary Nebulae. It is now correctly listed as an Emission Nebula with the famous 'Bubble' recognized as a hollow cavity within the HII region known as NGC 7635. It is extremely dim and 'tricky' to image well. | | | | | | ☻N 3 | |
| 8 |  | C14/NGC 869+884 | Sword Handle/Double Cluster | DSO: Open Cluster | Perseus | 02:19:04 | +57:08:06 | 5.3 | 36' |
| | | The 'Double Cluster' is one of the finest if not the finest of all open clusters in the heavens, made all the better for getting 'two for the price of one'. An object envied by Southern Observers for not being in their 'backyard', although they are reluctant to admit it, saying with a hint of bravado that they have the 'Jewel Box' (A26) instead. | | | | | | ☻N 1 | |
| 9 |  | C19/NGC 5146 | Cocoon Nebula | DSO: Emission Nebula | Cygnus | 21:53:24 | +47:16:00 | 9.3 | 10' |
| | | A beautiful emission nebula immersed in a murky lagoon lying at the end of a winding river of black nebulosity (B168). Only discovered In 1899 by the clergyman Thomas Espin and photographed for the first time the same year by Max Wolf, IC 5146 is very similar in appearance to the Trifid Nebula with its round form and dark lanes. Its inclusion in the 'A' List is largely due to the presence of B168 which in this case is more conspicuous than the Cocoon itself. A faint and tricky target. | | | | | | ☻N 3 | |
| 10 |  | C20/NGC 7000 | North American Nebula | DSO: Emission Nebula | Cygnus | 20:59:18 | +44:31:00 | 5.0 | 100' x 120' |
| | | One of the few objects in heavens whose common name truly resembles the shape it is meant to describe. A magnificent object whose imaging is made difficult by its immense size of nearly $2^{o}$ square, best captured by a mounted DSLR or a large format CCD and small aperture refractor. A subject capable of producing magnificently coloured results when imaged well. | | | | | | ☻N 4 | |

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|---|---|---|---|---|---|---|---|---|---|
| 11 |  | C23/NGC 891 | Outer Limits Galaxy | DSO: Spiral Galaxy | Andromeda | 02:22:33 | +42:20:50 | 10.1 | 1.6' x11.7' |
| | | A magnificent 'edge on' spiral galaxy named after the 60's sci-fi series which featured it. Although relatively difficult to see visually in a small telescope, due its dark central dust lane obscuring most of its light, it is a stunning object when captured on long exposure CCD images. It reminds me of a flying saucer hanging in space powered by an unknown alien technology. | | | | | | ☻N 3 | |
| 12 |  | C27/NGC 6888 | Crescent Nebula | DSO: Emission Nebula | Cygnus | 20:12:06 | +38:21:18 | 8.8 | 13'x18' |
| | | A much neglected object often not considered important or visually appealing enough for amateurs to even bother to track down. This is a mistake, for when it is imaged with sufficiently long exposures it is revealed to be a most beautiful object – a stunning crescent of glowing red gas amongst a myriad of stars, with an immensely hot and white Wolf-Rayet star glowing at its centre. | | | | | | ☻N S 3 | |
| 13 |  | C32/NGC 4631 | Whale Galaxy | DSO: Barred Spiral Galaxy | Canes Venatici | 12:42:8 | +32:32:30 | 9 | 3'x15' |
| | | An object that deserves to be included in the Messier Catalogue. It is one of the brightest and largest edge on galaxies, and a fascinating imaging target, which Stephen O'Meara in his Deep space Companion: 'The Caldwell Objects' aptly likened it to a 'rotting corpse of a galaxy', with a body riddled with knots, clumps and spots of different coloured shapes. | | | | | | ☻N S 3 | |
| 14 |  | C34/NGC 6960 | Witch's Broom Nebula | DSO: Supernova | Cygnus | 20:45:42 | +30:43:00 | 7.9 | 6'x70' |
| | | The western segment of the 'Veil' Nebula (NGC 6960), and along with its eastern part (NGC 6992 & 6995) is all that remains of a supergiant star which exploded some 15,000 years ago. We are now left with a magnificent Deep space Object made up fine delicate filaments of multi-coloured glowing gas against the star spangled background of the Cygnus Milky Way. An object that Isaac Roberts first imaged in 1896 and which is still amongst the most popular of targets | | | | | | ☻N S 3 | |
| 15 |  | C38/NGC 4565 | - | DSO: Spiral Galaxy | Coma Berenices | 12:36:20 | +25:59:16 | 9.5 | 2'x16' |
| | | Probably the finest and most famous of all 'edge on' spiral galaxies, made even more special because it can be easily imaged by observers in both hemispheres, a claim that its main rival NGC 891 cannot boast. It is an object that will reward you well if you have the patience to complete a sequence of long exposures. If you do not give in to eager anticipation you will see in great detail, one of the most mysterious and captivating of all Deep space Objects. | | | | | | ☻N S 3 | |

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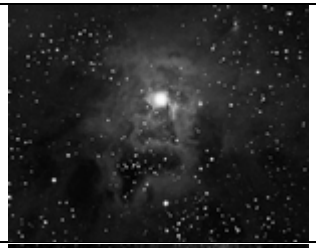
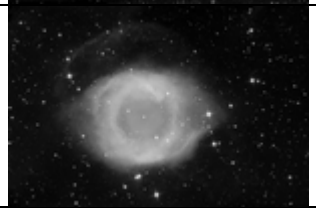
|---|---|---|---|---|---|---|---|---|---|
| 16 |  | C4/NGC 7023 | Iris Nebula | DSO: Reflection Nebula | Cepheus | 21:01:35 | +68:10:10 | 7.2 | 8'x10' |
| | | The Iris Nebula shines by the light reflected from the accompanying open cluster Collinder 429. Because it is reflection nebula its colour exhibits a most beautiful range of blue tints resembling that of the flower which gives it its name. | | | | | | ☻N 3 | |
| 17 |  | C49/NGC 2237 | Rosette Nebula | DSO: Emission Nebula | Monoceros | 06:30:55 | +05:02:52 | 5 | 50'x80' |
| | | The constellation of Monoceros is dull by comparison to its spectacular neighbour Orion, yet it does contain two of the most wonderful objects in the whole heavens. The first is the immense cloud of glowing hydrogen gas known as the Rosette Nebula. Although Orion has M42 perhaps the most famous and splendid of all Deep space Objects, the Rosette Nebula is still a magnificent object given that it in actual physical size it is three times bigger than its more famous rival. It is made all the more magnificent by the presence of the jewel like open cluster NGC 2244 at its centre. It is a large object and requires considerable skill in capturing its full splendour digitally, and in particular getting the contrast right between the bright regions and the dark lanes of obscuring matter which cross the nebula in all directions. | | | | | | ☻N S 4 | |
| 18 |  | C5/IC 342 | | DSO: Mixed Spiral Galaxy | Camelopardus | 03:46:48 | +68:05:44 | 8.4 | 15'x16' |
| | | The barren constellation of Camelopardus holds a great surprise – a spiral galaxy that is one that Messier definitely missed. IC 342 is a beautiful galaxy whose pinwheel structure closely resembles that of M74, but which unlike its more famous brother is brighter and lies in a field filled with starlight. M74 is a dim object surrounded by very few stars. | | | | | | ☻N 4 | |
| 19 |  | C60/C61/NGC 4038/9 | Antennae Galaxies | DSO: Irregular Galaxies | Corvus | 12:01:53 | -18:51:52 | 10.5 | 6'x11'<br>4'x10' |
| | | The Antennae Galaxies lie in the small constellation of Corvus and when William Herschel found them in 1785 he had seen nothing quite like it. At the time he had no idea that he had come across two galaxies of stars ripping each apart by the force of gravity. To me they remind of a heart tied to a ribbon – truly wonderful. | | | | | | ☻N S 3 | |
| 20 |  | C63/NGC 7293 | Helix Nebula | DSO: Planetary Nebula | Aquarius | 22:29:38 | -20:50:11 | 7.3 | 10'x12' |
| | | It is remarkable that the Helix Nebula the largest and one of the brightest of Planetary Nebula was discovered as late as 1862 by the German astronomer Georg Von Auwers. It is an object of breath-taking beauty when captured and processed by modern CCD technology. An object worth spending time and care on. | | | | | | ☻N S 2 | |

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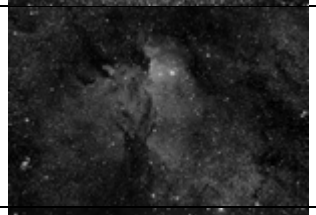
|---|---|---|---|---|---|---|---|---|---|
| 21 |  | C77/NGC 5128 | Centaurus-A | DSO: Peculiar Galaxy | Centaurus | 13:25:29 | -43:00:58 | 6.6 | 20'x26' |
| | | The galaxy known as Centaurus-A is a 'most wonderful object' which is how John Herschel described this 'one off'. It is an object which is unique – it looks like no other, it is one of the brightest galaxies, it is nearest and most violent of all Seyfert type galaxies and is one of the most powerful radio sources in the universe. | | | | | | ☻S 4 | |
| 22 |  | C80/NGC 5139 | Omega Centauri | DSO: Globular Cluster | Centaurus | 13:26:47 | -47:28:51 | 5.3 | 55' |
| | | The No. 1 Globular Cluster of them all, an object that Northern Observers would give their 'eye teeth' to have in their hemisphere. It is the brightest, the biggest and most splendid of them all. It is so dominant that Bayer included it as the star Omega Centauri in his catalogue of 1603. It was one of the first objects to be put on the 'A' List. | | | | | | ☻S 2 | |
| 23 |  | C82/NGC 6193 | | DSO: Open Cluster | Ara | 16:41:20 | -48:45:48 | 5.2 | 14' |
| | | The open cluster NGC 6193 owes its inclusion in the 'A' List to its surroundings and in particular the presence of the nebula NGC 6188, part emission and part reflection which transforms the field of view in the region to one of most beautiful in all the heavens. | | | | | | ☻S 4 | |
| 24 |  | C9/SH2-155 | Cave Nebula | DSO: Emission Nebula | Cepheus | 22:56:00 | +62:37:00 | 10.0 | 30'x50' |
| | | Sharpless 2-155 is an emission nebula in Cepheus which in part resembles the hollowed out entrance to a dark cave. The field of view surrounding SHII-155 is truly stunning made up of a confusion of dark and bright areas laid on a black canvas of sparkling starlight. A difficult object to capture effectively with its great variation in contrast between light and dark. | | | | | | ☻N 4 | |
| 25 |  | C92/NGC 3372 | Eta Carinae Nebula | DSO: Emission Nebula | Carina | 10:45:06 | -59:52:00 | 4.8 | 120'x 120' |
| | | A truly magnificent object destined for the 'A' List even before I had taken the top off my pen. A large object spanning an area of sky two degrees square made up of vast areas of alternating light and dark, driven by energy from a concentration of very hot young stars. It is a great disappointment that to all in the North that it cannot be seen by them. But if you are to complete this challenge you will have to image it for yourself no matter where you live! | | | | | | ☻S 4 | |

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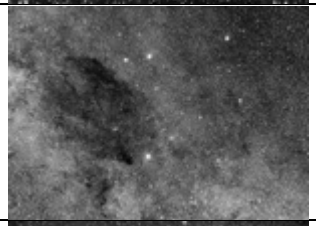
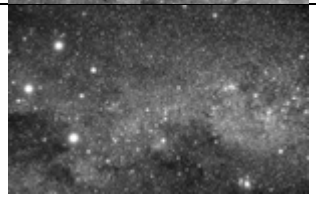
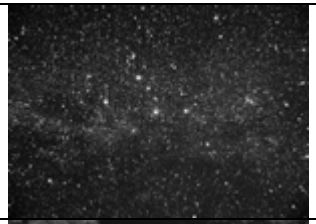
|---|---|---|---|---|---|---|---|---|---|
| 26 |  | C94 | Jewel Box | DSO: Open Cluster | Crux | 12:53:39 | -60:21:42 | 4.2 | 10' |
| | | One of the most magnificent objects in the heavens, and one which merits automatic inclusion in the 'A' List. It is so called for reasons which become immediately apparent when first viewed through a telescope –a stunning collection of coloured jewels against a background of black satin sky. It is a perfect target for the beginner, bright and fairly large giving pleasing results even when imaged for the first time. | | | | | | ☻S 1 | |
| 27 |  | C99 | Coal Sack Nebula | DSO: Dark Nebula | Crux | 12:53:00 | -63:00:00 | | $5^{o}$x$7^{o}$ |
| | | An object known by the indigenous Aborigines of Australia for tens of thousands of years. It was not until 1930 that the true nature of dark nebula became known, prior to this the Coal Sack and others like it had been the subject of myth and legend. William Herschel believed them to be *'Loch im Himmel'* – openings in heaven. Even Edward Emerson Barnard who had spent years studying and photographing them, agreed with this view for many years. | | | | | | ☻S 3 | |
| 28 |  | Carina | The Keel | DSO: Constellation | Carina | 08:45:36 | -59:53:24 | | 494 sq. deg. |
| | | The star fields of the Carina Milky Way are arguably the most magnificent in all the heavens, containing celestial treasures like the Eta Carinae Nebula, the 'Pincushion' Cluster (NGC 3532) and the 'Southern Pleiades' (IC 2602). The constellation covers a very wide area and can only be captured effectively with a DSLR attached to a motor driven mount. | | | | | | ☻S 3 | |
| 29 |  | Cassiopeia | The Queen | DSO: Constellation | Cassiopeia | 01:00:36 | +62:12:00 | | 598 sq. deg. |
| | | Cassiopeia is a constellation through which the Northern Milky Way traverses its borders, and is some 20% larger than Carina. It contains some of the finest star fields in the Northern hemisphere and an amazing abundance of Open Clusters and Nebulae, including M52, M103, NGC 7635 the 'Bubble Nebula'. | | | | | | ☻N 2 | |
| 30 |  | Clavius | - | Moon Crater | Zodiacal | $14.4^{o}$W | $58.4^{o}$S | | 231 km: 2' |
| | | Clavius is probably the most impressive and unmistakable crater on the surface of the Moon and one of the largest measuring some 231 km across. Situated in the crater laden Southern Uplands its distinctive chain of craters on its floor make it immediately recognizable and 'cries out' to be imaged. A beginner's object and will provide valuable experience in the use of a webcam and the processing of video frames with software such as RegiStax. | | | | | | ☻N S 2 | |

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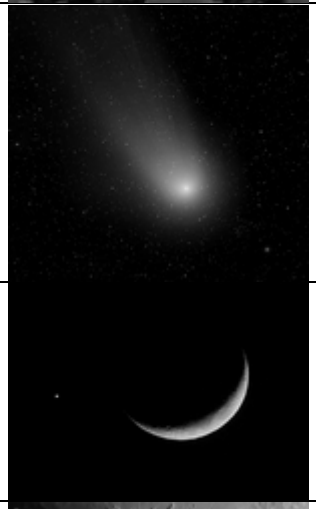
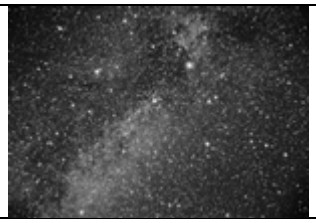
|---|---|---|---|---|---|---|---|---|---|
| 31 |  | Clouds | - | Earth | NA | | | | |
| | | How many of us have laid down in a field on a summer's day looking up at the clouds and remarking on their beauty and diversity? Equally how many of us have taken a photograph of them?, and how many of us have cursed them for their untimely arrival during a long imaging session? They are important to Astrophotographers and should be in the 'A' List. | | | | | | ☺ ☻ N S 1 | |
| 32 |  | Comet | - | Planetary | Zodiacal | | | | |
| | | The arrival of bright Comet is a major event both for astronomers and the general public alike and has been so for thousands of years, especially if it can be seen in broad daylight. Indeed we have much to thank Comets for, perhaps life on Earth itself. Even Deep space Astrophotographers owe Comets a debt, if it hadn't has been for them Charles Messier would never have compiled his list of 109'embarrassing objects', and where would that have left us? | | | | | | ☺ ☻ N S 3 | |
| 33 | | Conjunction | - | Planetary | Zodiacal | | | | |
| | | A Conjunction or 'lining up' of Moon, Planet and Stars can be a spectacular sight particularly in the early evening shortly after the setting of the Sun. I wish I had a Euro every time I was asked 'Did you see that last night - the Moon and the two bright stars?' – i.e. Venus and Jupiter, and 100 Euros for 'Can that cause the end of the world – someone said it could?' | | | | | | ☻ N S 3 | |
| 34 |  | Copernicus | - | Moon Crater | Zodiacal | 20°W | 9.7°N | | 95km: 1' |
| | | The crater Copernicus emerging from the blackness of the lunar terminator is one of the most breath-taking sights in all the heavens. How many amateur astronomers have been awestruck when they glimpse this event for the first time? It is something that should be recorded for posterity by all Astrophotographers. | | | | | | ☻ N S 2 | |
| 35 |  | Cygnus | The Swan | Constellation | Cygnus | 20:37:12 | +42:01:48 | | 804 sq. deg. |
| | | The constellation of Cygnus is one of the Northern hemisphere's celestial wonders. High up overhead in the summer the Milky Way meanders its way through the whole length of the 'swan's' body, and within its boundaries lie some of the most spectacular star fields, open clusters and nebulae. | | | | | | ☻ N 3 | |

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|---|---|---|---|---|---|---|---|---|---|
| 36 |  | Earthshine | New Moon in Old Moon's Arms | Moon | Zodiacal | | | -1.2 | 29.3' – 34.1' |
| | | The phenomenon of Earthshine occurs near New Moon when light from the Earth is reflected off the lunar surface to create this magical effect whereby the whole of the 'unlit' moon's disc can be seen glowing weakly against the background of an ever darkening sky. | | | | | | ☻N S 4 | |
| 37 |  | Famous Camera | e.g. Kew Photoheliograph | Historical | NA | | | | |
| | | It is important for the modern Astrophotographer to learn of the great debt they owe to the early pioneering astronomers who made it all possible. The next three 'A' List objects have been chosen to this end. They are not so much challenges but learning experiences where knowledge is gained on who these pioneers were, what contributions they made and the type of equipment they used. The first and most difficult is an early Camera which was used by a pioneering Astrophotographer. | | | | | | ☺ ☻N S 3 | |
| 38 |  | Famous Observatory | e.g. Meudon Observatory, Paris, France | Historical | NA | | | | |
| | | The second of these 'learning' objects is an observatory which was used by astronomers to make significant advances in our understanding of the universe, and especially through the use of astrophotography. Such Observatories would include the likes of Mount Wilson & Palomar, the Royal Greenwich Observatory and the Anglo Australian Observatory. | | | | | | ☺ ☻N S 2 | |
| 39 |  | Famous Telescope | e.g. Lord Rosse's 72" Reflector Birr Castle, Offaly, Ireland. | Historical | NA | | | | |
| | | The last of this trio of 'knowledge enhancing' objects is a telescope which was used by astronomers to make ground breaking discoveries in astronomy. Such telescopes would include Galileo's telescope, Isaac Newton's Reflector and William Herschel's 7' and 40' reflectors.<br><br>As an extra challenge why not put down on paper why you chose the three objects you did, not just because they were the nearest to you, but what made them important to astronomy and to yourself as a modern Astrophotographer, cushioned by the likes of GOTO telescopes, adaptive optics, automatic focusers, and software like 'The Sky', MAXIM DL and Photoshop. See http://www.catchersofthelight.com/astrophotography-famous-pioneers.aspx for some ideas for objects A37, A38 and A39. | | | | | | ☺ ☻N S 2 | |

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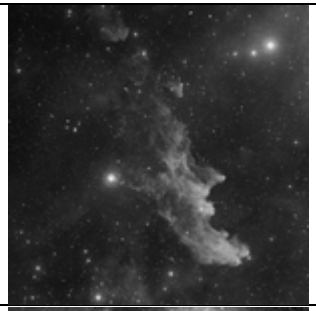
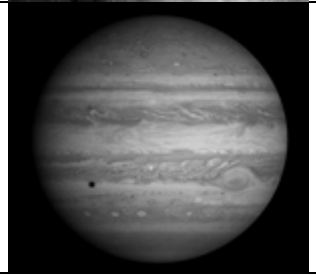
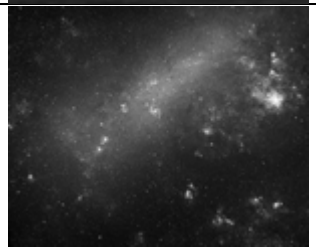
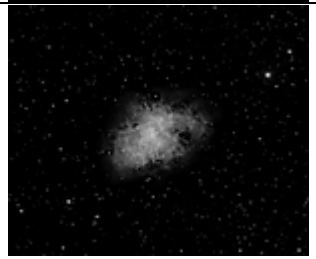
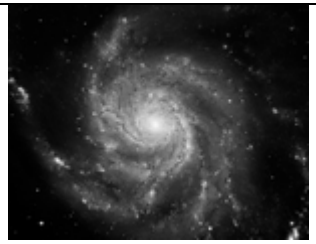
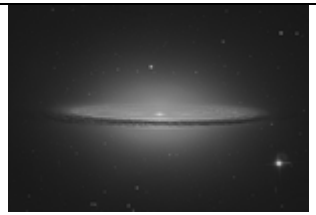
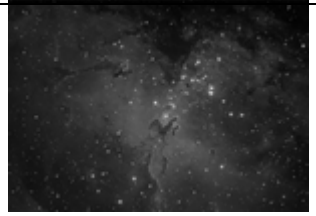
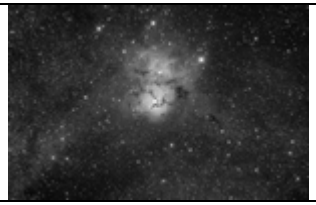
|---|---|---|---|---|---|---|---|---|---|
| 40 |  | Full Moon | - | Moon | Zodiacal | | | -12.6 | 29.3' – 34.1' |
| | | The Full Moon has held a fascination for us all ever since man first looked up into the night sky. It is often seen the curse of the Astrophotographer, being of no use to either the deep space or lunar enthusiast, it just drenches everything with a bright and intense light that casts shadows on the ground and over the sea. It is an object that you I either love or hate. Nevertheless it is one of the most spectacular objects you could ever wish to image by day or night. I know it will be hard for the avid DSO imager to swallow his pride and get out his precious SBIG or FLI CCD and point it at the Moon! | | | | | | ☺ ☻N S 2 | |
| 41 |  | Green Flash | At World's End | Earth | Zodiacal | | | | |
| | | This object is the 'wild card' of the 109 objects in the 'A' List. A very rare event indeed. It is an optical phenomenon which occurs shortly after sunset or before sunrise when a green spot can be seen. It is best observed from a location with a clear horizon, such as over the Ocean. To give you some idea of how rare it is, I have lived by the Mediterranean sea with an unobstructed view of the western horizon for the past 10 years and have as yet never seen it. Good Luck! | | | | | | ☺N S 10 | |
| 42 |  | IC 2118 | Witch Head Nebula | DSO: Reflection Nebula | Eridanus | 05:04:54 | -07:15:00 | | $3^{o}$x$1^{o}$ |
| | | A large and faint Reflection Nebula which really does resemble the head of an aged and ugly witch. A difficult object best captured by a large format CCD or if you don't have one then a DSLR attached to a motor driven mount will suffice. I probably depressed you with my helpful remarks on the last object!, so in order to make it amends I will give you a piece of advice - take extra care when processing the contrasting areas of this object as otherwise the witch's head will not be seen, a number of long exposures 10 minutes or more helps as well! | | | | | | ☻N S 4 | |
| 43 |  | IC 4604 | Rho Ophiuchi Nebula | DSO: Star Field + Nebulosity | Ophiuchus | 16:25:35 | -23:27:00 | 7.2 | 60' |
| | | Another object which cries out for automatic inclusion in the 'A' List, when captured well the nebulosity surrounding the star rho ophiuchi exhibits the most glorious display of colours – blues, purples, reds, oranges and yellows. | | | | | | ☻N S 3 | |
| 44 |  | Jupiter | - | Planetary | Zodiacal | | | -1.6 to -2.9 | 29.8" to 50.1" |
| | | Jupiter is the planet which exhibits most detail to both the visual and photographic observer, and furthermore what is seen is for ever changing. It is a most magnificent object even in the smallest of telescopes with its multi-coloured belts and spots, as well as the shadows and transits of its four Gallilean Satellites across its surface. An automatic choice for inclusion in the 'A' List. | | | | | | ☺ ☻N S 2 | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 45 |  | Lightning | Thunderbolt | Earth | NA | | | | |
| | | Not an immediately obvious choice for the 'A' List. However every astrophotographer on earth must have had seen and had an imaging session spoiled by the appearance of a storm accompanied by Lightning. You can look on Lightning as a bonus – another magnificent imaging target, which it undoubtedly is! | | | | | | ☺ ☻N S 3 | |
| 46 |  | LMC | Large Magellanic Cloud | DSO: Irregular Dwarf Galaxy | Dorado | 05:23:34 | -69:45:22 | 0.9 | 9.2°x 10.8° |
| | | The Large Magellanic Cloud is a close neighbor of our own Milky Way Galaxy some 160,000 light years distant and was first recorded by the Persian astronomer Al Sufi in 964 AD. However it was Ferdinand Magellan who first popularized its existence and it now bears his name. It is one of the celestial treasures of the Southern Hemisphere, and the unfortunate observers in the North have nothing remotely like it! Something of a challenge because of its sheer size. | | | | | | ☻S 3 | |
| 47 |  | Lunar Eclipse | - | Moon | Zodiacal | | | | 29.3' - 34.1' |
| | | A Lunar Eclipse although not as spectacular as that of Solar Eclipse, can be viewed from anywhere on Earth which is on the dark side. It is therefore easier to see and requires no travelling to some out of the way place. Furthermore totality can last as long as 107 minutes as opposed to a maximum of 7m 31s for a Total Solar Eclipse. On average there are about two partial Lunar Eclipses each year, ones which are Total occur less frequently and are typically one to three years apart. Lunar Eclipses differ greatly in colour ranging from very dark almost black to gorgeous oranges and reds. | | | | | | ☻N S 4 | |
| 48 |  | Lunar Halo | - | Moon | Zodiacal | | | -12.6 | 22° |
| | | A Lunar Halo is a relatively rare event but one not to be missed by any Astrophotographer even deep space enthusiasts! It is caused by sunlight reflected off the Moon onto high cirrus-stratus clouds which produce a halo of 22 degrees radius around the Moon. It is a subject which requires a degree of imagination and creativity on the imager's part, and if done well can produce a result to be proud of! | | | | | | ☻N S 5 | |
| 49 |  | M1 | Crab Nebula | DSO: Supernova | Taurus | 05:34:32 | +22:00:52 | 8.4 | 4'x6' |
| | | The 'Crab' Nebula or M1 is the finest example of the remnants of a star which has exploded – a supernova. It is also the object which made Charles Messier begin his famous catalogue of what he called 'embarrassing objects', referring to the fact that they could easily be mistaken for comets. It is an ideal beginner's target and one which even the experienced imager should spend the time to capture with its delicate network of web like filaments of reds and pinks. | | | | | | ☻N S 1 | |

# The Astrophotographers' – 'A' List of Imaging Targets

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 50 |  | M101 | - | DSO: Spiral Galaxy | Ursa Major | 14:03:12 | +54:20:58 | 7.5 | 27'x29' |
| | | One of the finest examples of a 'face on' spiral galaxy. It is large and bright and one of the most popular of imaging targets for the northern observer. It is what everyone expects a 'galaxy' to look like – a bright central core surrounded by arms that swirl around it like a 'Catherine' wheel at a fireworks party. | | | | | | ☻N 2 | |
| 51 |  | M104 | Sombrero Hat Galaxy | DSO: Spiral Galaxy | Virgo | 12:39:59 | -11:37:21 | 7.5 | 4.2'x 8.6' |
| | | An iconic Galaxy made famous by its Hubble Space Telescope image. It is a magnificent example of a near edge on spiral galaxy, exhibiting an immensely bright core and surrounded by a dark dust lane which makes up the 'hat band' of the Sombrero. A challenging object when it comes to processing the image, requiring great care to not 'wash out' the core and maintain detail in dust lane. | | | | | | ☻N S 2 | |
| 52 |  | M13 | Great Hercules Cluster | DSO: Globular Cluster | Hercules | 16:41:41 | +36:27:39 | 5.8 | 20' |
| | | Arguably the finest example of a Globular Cluster visible in the Northern hemisphere, although some would argue that M5 should be in the list in its place. It must be remembered this is a list for astrophotographers and not visual observers. Seen visually through a small telescope M5 probably has the edge, but photographically M13 is a superb when captured well. | | | | | | ☻N S 2 | |
| 53 |  | M16 | Eagle Nebula | DSO: Emission Nebula + Open Cluster | Serpens Cauda | 18:18:45 | -13:47:54 | 6 | 8'x8' |
| | | An automatic 'A' List entry. It is a most magnificent object which has at its centre a mystical black eagle soaring through a red cloud of glowing gas. Another object made famous by the Hubble Space telescope and its showing the so called 'pillars of creation'. This an object an imager can return to time and time again forever trying to 'out do' his last attempt. | | | | | | ☻N S 2 | |
| 54 |  | M20 | Trifid Nebula | DSO: Nebula + Open Cluster | Sagittarius | 18:02:42 | -22:58:18 | | 20'x20' |
| | | Another must for the 'A' list, and one of the most colourful of all deep space objects, with its contrasting segments of pink and blue against a black backdrop lit by myriads of stars. This a photographic object where views through small telescopes are bound to disappoint, and which should encourage every visual observer to replace his eyepiece with a CCD chip! | | | | | | ☻N S 2 | |

# The Astrophotographers' – 'A' List of Imaging Targets

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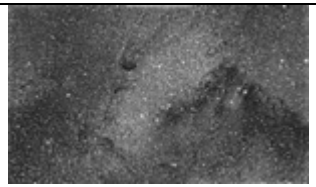
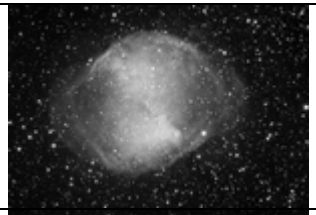
|---|---|---|---|---|---|---|---|---|---|
| 55 |  | M24 | Small Sagittarius Star Cloud | DSO: Star Field | Sagittarius | 18:18:24 | -18:24:24 | 4.6 | $2^{o}$x$1^{o}$ |
| | | In contrast to M20, the Small Sagittarius Star Cloud is a magnificent sight through the eyepiece of a small telescope. However, when seen through the 'eyes' of a CDD chip, the visual view does not do this object justice. Take the image and see for yourself! | | | | | | ☻N S 3 | |
| 56 |  | M27 | Dumbbell Nebula | DSO: Planetary Nebula | Vulpecula | 19:59:36 | +22:43:18 | 7.4 | 6.7' |
| | | The most famous and most stunning of all Planetary Nebulae, both visually and photographically. It is one of the few Messier objects whose visual view matches that of its photographic image (without the colour I may add!). An ideal beginner's target which looks good even when it is your first attempt at imaging anything! One of my favourite objects. | | | | | | ☻N S 1 | |
| 57 |  | M31 | Great Nebula in Andromeda | DSO: Spiral Galaxy | Andromeda | 00:42:44 | +41:16:08 | 3.5 | $1^{o}$x$3^{o}$ |
| | | M31 has been known as the 'Great Nebula in Andromeda' for over a 1000 years and marvelled at long before 1899 when Julius Scheiner analysed its spectrum to reveal its true nature as a galaxy like our own made up of millions of stars. One of the most famous subjects for the Astrophotographer ever since Isaac Roberts's pioneering image of 1888. | | | | | | ☻N 3 | |
| 58 |  | M33 | Pinwheel Galaxy | DSO: Spiral Galaxy | Triangulum | 01:33:52 | +30:39:29 | 5.5 | 42'x69' |
| | | Although smaller and fainter than its more famous and illustrious neighbor M31, the Triangulum or Pinwheel Galaxy is magnificent object for the Astrophotographer. It is abundant in star clusters and emission nebulae which are readily apparent when imaged, making this one of the most beautiful of all galaxies. The largest HII region in the galaxy is very conspicuous in moderate sized amateur telescopes and is even bright enough to have its own NGC number 604. | | | | | | ☻N S 2 | |
| 59 |  | M42 | Great Orion Nebula | DSO: Emission Nebula | Orion | 05:35:17 | -05:23:25 | 3.7 | 60'x65' |
| | | Arguably the most famous and magnificent deep space object of them all. It is remarkable that this object was not officially discovered until as late 1611 by the French astronomer Nicolas Peiresc. It is a mystery why an object as obviously visible to the naked eye as M42 should not have been known since antiquity. It is the number one target for beginners, what is more interesting is that the average 'first light' attempt closely resembles Henry Draper's image of M42 taken in 1880 – the first deep space object ever photographed. | | | | | | ☻N S 2 | |

# The Astrophotographers' – 'A' List of Imaging Targets

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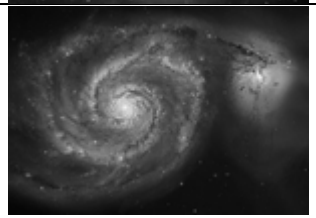
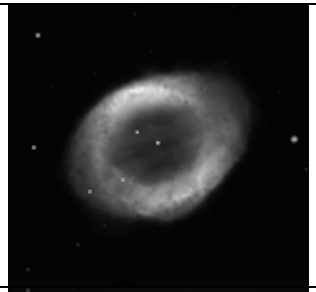
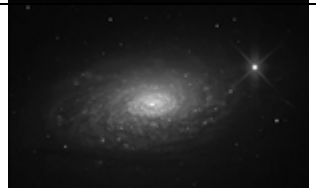
|---|---|---|---|---|---|---|---|---|---|
| 60 |  | M45 | The Pleiades – Seven Sisters | DSO: Open Cluster + Nebulosity | Taurus | 03:45:49 | +24:22:06 | 1.5 | $2^{o}$x$2^{o}$ |
| | | A splendid Open Cluster even for the smallest of telescopes, which becomes even more so when photographed. When imaged the embedded nebulosity caused by starlight reflected off its hot white stars bathing the whole cluster in misty pale blue cloud of indescribable beauty. | | | | | | ☻N S 2 | |
| 61 |  | M51 | Whirlpool Galaxy | DSO: Spiral Galaxy | Canes Venatici | 13:29:53 | +47:11:44 | 8.1 | 6.9'x 11.2' |
| | | An iconic object, the finest example of a 'face on' spiral galaxy. In 1845 William Parsons, the 3rd Earl Rosse, trained the 72" mirror of the *'Leviathan of Parsonstown'* on M51, and revealed for the first time the spiral structure of a galaxy. A magnificent object, deserving without question its place in the 'A'List. | | | | | | ☻N 1 | |
| 62 |  | M57 | Ring Nebula | DSO: Planetary Nebula | Lyra | 18:53:35 | +33:01:47 | 8.8 | 2.4'x 3' |
| | | An object of simplistic beauty and has often been likened to a smoke ring. It is a sight that no amateur astronomer ever forgets and one which is on high up on every Astrophotographers list of targets. Unlike a visual observer M57's 15th magnitude central star is easy to capture. What is more difficult is faint nebulosity which lies outside the main ring structure and the faint barred spiral galaxy IC 1296 which lies less than 4' away. | | | | | | ☻N S 2 | |
| 63 |  | M63 | Sunflower Galaxy | DSO: Spiral Galaxy | Canes Venatici | 13:15:49 | +42:01:59 | 8.5 | 7.2'x 12.6' |
| | | M63, the 'Sunflower' Galaxy is unusual in that in long exposure photographs it looks like it has lost all control of its spiral arms which are about to be flung off into space. It is a galaxy which exhibits considerable detail and does bear a striking resemblance to the flower which gives it its name. If imaged well its outlying areas exhibit an almost ethereal blue glow. | | | | | | ☻N 2 | |
| 64 |  | M65/M66/NGC3628 | Leo Triplet | DSO: Galaxies | Leo | 11:20:16 | +13:35:24 | - | $1^{o}$x$1^{o}$ |
| | | A trio of Galaxies made up of two Messier spirals - M65 and M66 and an edge on companion known as King Hamlet's Ghost (NGC 3628) so named because it gets fainter every time you increase the magnification of the eyepiece. It is the finest 'galactic trio' visible in the heavens and an automatic choice for the 'A' List. | | | | | | ☻N S 3 | |

# The Astrophotographers' – 'A' List of Imaging Targets

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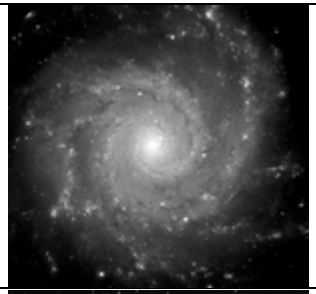
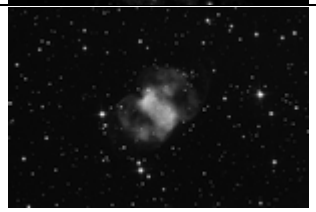
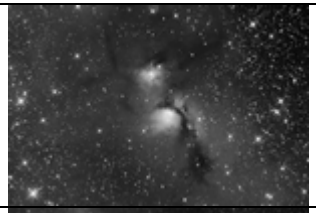
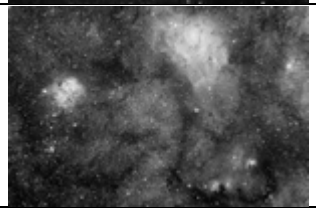
|---|---|---|---|---|---|---|---|---|---|
| 65 |  | M74 | Phantom Galaxy | DSO: Spiral Galaxy | Pisces | 01:36:42 | +15:47:00 | 9.1 | 9.5'x 10.5' |
| | | A difficult galaxy visually, and probably the hardest Messier object to see because of its extremely low surface brightness (magnitude 14.4). It is an object best imaged under the darkest of skies free from the degrading effects of light pollution. In order to capture it well use as many exposure of the greatest possible duration your equipment and location will allow. | | | | | | ☻N S 3 | |
| 66 |  | M76 | Little Dumbbell Nebula | DSO: Planetary Nebula | Perseus | 01:42:22 | +51:34:50 | 10.1 | 1.1' |
| | | Although much less well known, smaller and fainter than its bigger 'Dumbbell brother', M76 exhibits a wealth of colour, shape and detail that makes it an exceptional imaging target. Instead of a ring or disc as is the case with M57 and M27, M76 it has a rectangular bar with semi-circular lobe attached to each of its two longer sides | | | | | | ☻N 2 | |
| 67 |  | M78 | - | DSO: Reflection Nebula | Orion | 05:46:45 | +00:04:48 | 8.0 | 6'x8' |
| | | A much ignored and underappreciated Messier object often ignored by Astrophotographers. This is a mistake. Long exposure images reveal an object of eerie and mystical beauty, complete with pale glowing patches of blue reflection nebulosity lying amongst dark areas of light obscuring dust and gas. | | | | | | ☻N S 3 | |
| 68 |  | M8 | Lagoon Nebula | DSO: Emission Nebula | Sagittarius | 18:03:42 | -24:22:48 | 4.6 | 30'x45' |
| | | M8, the 'Lagoon' Nebula is another automatic choice for inclusion in the 'A' List. It is one of the most magnificent of all Emission Nebulae to be found in the heavens. It is bright, large and full of the most amazing detail – dark dust lanes and areas of glowing HII Gas, powered by the energy of the 6$^{th}$ magnitude star 9 Sagittarii and 9$^{th}$ magnitude Herschel 36. | | | | | | ☻N S 2 | |
| 69 |  | M8/NGC6559/M20 | Sagittarius Triplet | DSO: Star Field + Nebulae | Sagittarius | 18:03:42 | -24:22:48 | - | 2$^{o}$x2$^{o}$ |
| | | A magnificent star field made up three emission nebulae – M8, NGC6559 and M20 glowing brightly against the back drop of the Sagittarius Milky Way. It is the equal of the Rho Ophiuchi Nebulosity and presents the imager with an opportunity to capture a magnificent piece of 'Sky Art' that would grace the wall of any Gallery. | | | | | | ☻N S 3 | |

# The Astrophotographers' – 'A' List of Imaging Targets

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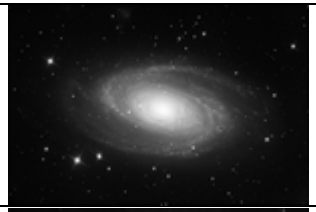
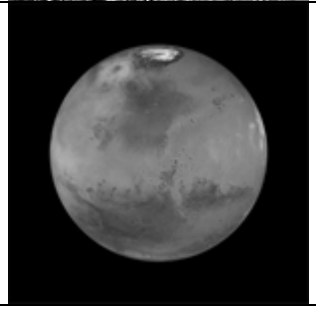
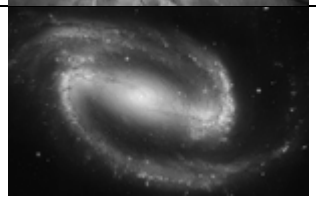
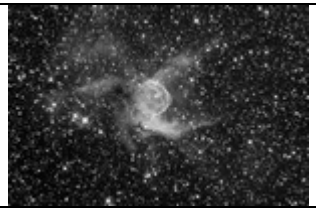
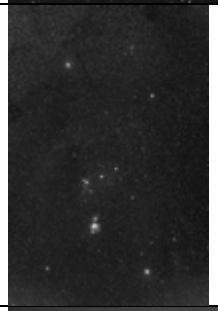
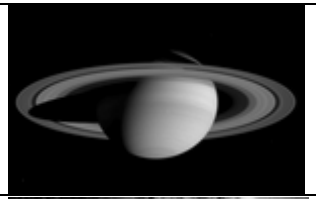
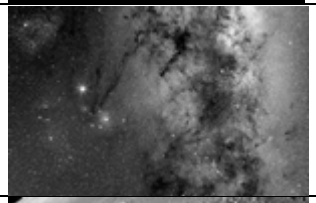
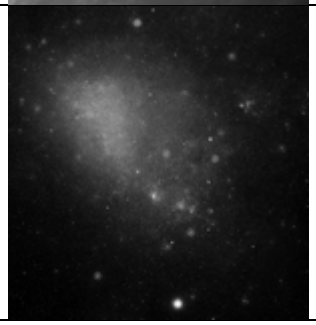
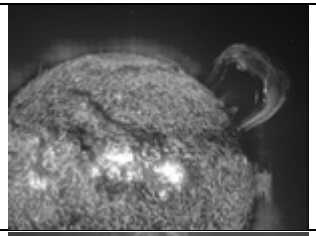
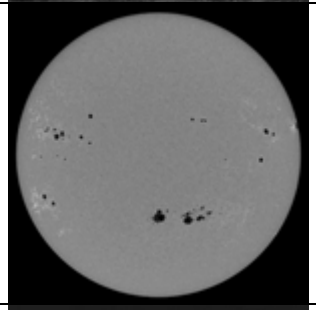
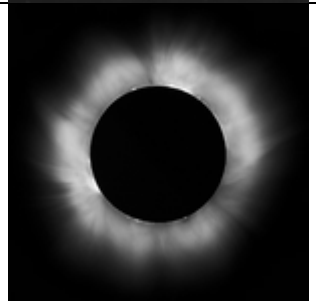
|---|---|---|---|---|---|---|---|---|---|
| 70 |  | M81 | Bode's Galaxy | DSO: Spiral Galaxy | Ursa Major | 09:55:33 | +69:04:02 | 7.0 | 11.5x 24.9' |
| | | One of the most beautiful and captivating images in the heavens – the most perfectly formed of all spiral galaxies. Often referred to as 'Bode's' Galaxy named after its discoverer, Johan Elert Bode, made famous by his Law on the Planetary Distances. | | | | | | ☻N 2 | |
| 71 |  | M82 | Cigar Galaxy | DSO: Irregular Galaxy | Ursa Major | 09:55:54 | +69:40:59 | 8.8 | 4.3'x 11.2' |
| | | M82 can be seen in the same low power field of view as M81, but there the similarity ends. Where M81 is a picture of order and calm, M82 is anything but. It is a scene of total chaos caused by what is believed to be 'starburst' activity, i.e. a series of supernova explosions in their early stages of expansion. An amazing object and a must for the 'A' List. | | | | | | ☻N 2 | |
| 72 |  | Mare Imbrium | Sea of Showers | Moon Mare | Zodiacal | 20°W | 30°N | - | 1287 km: 11' |
| | | One of most magnificent of all lunar landscapes. It is a scene that is very special to me, as it was the very first thing I saw through a telescope. Even though the telescope was one of those almost useless small reflectors it still captivated me and caused me to become a professional astronomer in my early days. There is so much to see - the Mare floor littered with craters of all shapes and sizes, peaks, mountain chains and valleys all vying for attention as your eye does not know which to look at first. | | | | | | ☺ ☻N S 2 | |
| 73 |  | Mare Nubium | Sea of Clouds | Moon Mare | Zodiacal | 15°W | 10°S | | 772km : 7' |
| | | Another magnificent lunar landscape which contains the famous - *Rupes Recta* better known by its common name - the 'straight wall' as well many ghost features and high albedo craters, which conjured up the idea of it looking like lunar clouds. It is one of these subjects which when you look at it you see something different every time. | | | | | | ☺ ☻N S 2 | |
| 74 |  | Mars | Red Planet | Planetary | Zodiacal | | | 1.8 to -2.9 | 3.5" to 25.1" |
| | | Mars a planet that has fascinated astronomers for centuries, considered by many scientists to be the place with the best chance of supporting life, albeit of a very primitive form. It like Jupiter has a surface which is forever changing with the passage of the Martian seasons – shrinking and expanding polar ice caps, dark areas formed during the Martian summer and dust storms. Try to see if you can capture images of its two tiny moons – Phobos and Deimos. | | | | | | ☺ ☻N S 2 | |

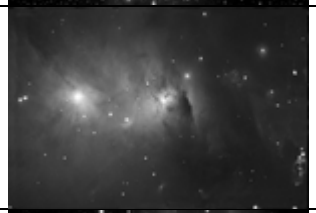
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 75 |  | Meteor | Shooting Star | Earth | NA | | | Var. | Var. |
| | | The appearance of a bright meteor or even better a Bolide (fireball) although transitory and unpredictable is a subject well worth waiting for, and one which requires much patience and preparation if success is to be achieved. Your chances of success are greater if you plan your imaging sessions arrange the times of the well-known meteor showers such as the Quadrantids, Perseids and Leonids. However a bright fireball can happen at any time so always be prepared. If you want a distinct edge on other imagers then invest in an 'all sky' camera! | | | | | | ☻N S 3 | |
| 76 |  | Meteorite Crater | | Earth | NA | | | - | Var. |
| | | It is a logical that the next item on the 'A' List should record the potential result the previous object may have on the earth's surface. There at least 50 well known and proven asteroid impact craters which are spread over Europe, Asia, North and South America and Australasia. | | | | | | ☺N S 3 | |
| 77 |  | NGC 1300 | | DSO: Barred Spiral Galaxy | Eridanus | 03:19:41 | -19:24:41 | 10.3 | 4'x6' |
| | | Probably the finest example of a 'barred' spiral galaxy, laying some 61 million light years away on the banks of the river Eridanus. It is about 110,000 light years across and therefore slightly larger than our Milky Way. A wide angle shot will reveal a number of background galaxies, thus providing a more varied and interesting imaging option. | | | | | | ☻N S 3 | |
| 78 |  | NGC 1499 | California Nebula | DSO: Emission Nebula | Perseus | 04:03:14 | +36:22:00 | 6.0 | 40'x 160' |
| | | A stunning emission nebula discovered in 1884 by Edward Emerson Barnard, so named because in shape it closely resembles the US State of California. It is a very difficult object visually, because of its large size and low surface brightness. The use of a Hydrogen-Beta filter and dark skies will help if this object is to be imaged well. | | | | | | ☻N S 2 | |
| 79 |  | NGC 2359 | Thor's Helmet | DSO: Emission Nebula | Canis Major | 07:18:30 | -13:13:30 | - | 6'x9' |
| | | An emission nebula energized by the light of the hot Wolf-Rayet star at its centre. It lies at a distance of 15000 light years. The object is so named because in shape it resembles the helmet seen in many depictions of the Norse 'God of Thunder' – Thor. Images of it exhibit a complex structure of nebulosity made up of many shades of pastel reds, greens and blues. | | | | | | ☻N S 3 | |

# The Astrophotographers' – 'A' List of Imaging Targets

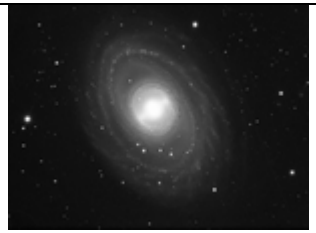
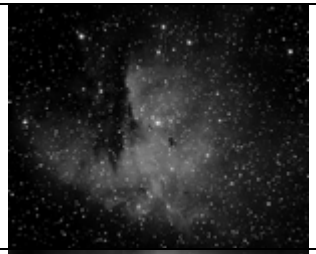
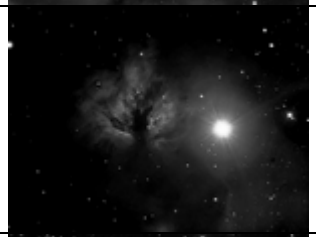
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 80 |  | NGC 2736 | Pencil Nebula | DSO: Supernova | Vela | 09:00:17 | -45:56:53 | | 2'x20' |
| | | NGC 2736 is part of the remnant of a Supernova which exploded some 12,000 years ago. It was discovered in 1835 by Sir John Herschel when he was visiting the Cape of Good Hope, so named because in shape it is in the form of a very thin ray of light - almost pencil like. Long exposure photographs reveal an object of simplistic beauty in a very rich star field. | | | | | | ☻S 2 | |
| 81 |  | Abell Cluster 1060 | Hydra Cluster | DSO: Galaxy Cluster | Hydra | 10:37:02 | -27:33:56 | - | 30'x30' |
| | | A Galaxy Cluster is an awe inspiring sight and may well cause you to ponder difficult questions like the meaning of life and the insignificance of our Earth in the scheme of things. The astronomer George Abell compiled a catalogue of 2712 galactic clusters in the Northern Hemisphere of which Abell 1060 is a splendid group of about 157 bright Galaxies. | | | | | | ☻N S 3 | |
| 82 |  | NGC 7317 Group | Stephan's Quintet | DSO: Galaxy Cluster | Pegasus | 22:35:51 | +33:56:43 | - | 10'x15' |
| | | A small group of five galaxies discovered in 1877 by Edouard Stephan at the Marseille Observatory. It consists of the following members – NGC 7317, NGC 7318a, NGC 7318b, NGC 7319 and NGC 7320c. A favourite target for Deep space Imagers. | | | | | | ☻N S 3 | |
| 83 |  | Orion | The Hunter | DSO: Constellation | Orion | 05:35:24 | +04:34:38 | - | 594 sq. deg. |
| | | The constellation of Orion is probably the most unmistakable star pattern to be seen in the heavens. Not only is it used as a 'finder' to other locate other constellations, in contains two of the Brightest Stars in the Sky – the red giant Betelgeuse and the white hot Rigel, not to mention ? others brighter than the second magnitude, and is home to some of the finest deep space objects – M42, M78, B33 (Horse Head), NGC 2024 (Flame Nebula) and NGC 1977 (Running Man). | | | | | | ☻N S 3 | |
| 84 |  | Parhelia | Sun Dogs | Earth | Zodiacal | | | - | |
| | | Parhelia meaning 'by the Sun' is a particular form of 'Ice Halo' caused by hexagonal shaped ice crystals forming in high altitude cirrus clouds. They are commonly known as Sun Dogs and can be seen from anywhere in the world and during any season. In Europe and the USA they can be seen as often as once or twice a week, but not always bright enough to image. | | | | | | ☺N S 5 | |

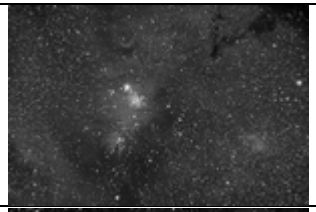
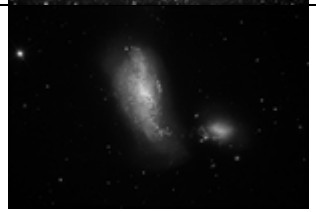
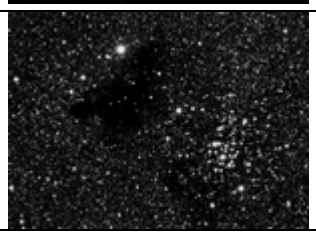
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 85 |  | Pluto | The 9th Planet? | Planetary | Zodiacal | | | 15.1 | .065" to .115" |
| | | For over 70 years every school child had ingrained often unwillingly into their brains that Pluto was the 9th planet of the Solar System. It came to me as a great shock tinged with sadness that when Pluto was demoted to the status of a 'Dwarf' planet. Let us not forget Pluto, so as my tribute I included it in the 'A' list as a true and full member of this exclusive club! | | | | | | ☻N S 4 | |
| 86 |  | Saturn | Ringed Planet | Planetary | Zodiacal | | | 1.2 to -0.24 | 14.5" – 20.1" |
| | | Undoubtedly the 'star' of all the planets in our solar system, especially when the rings are fully opened to the observer. Although its belts are less pronounced than Jupiter's they are nevertheless worth the effort imaging. An automatic choice for inclusion in the 'A' List. | | | | | | ☺ ☻N S 2 | |
| 87 |  | Scorpius | The Scorpion | Constellation | Scorpius | 16:59:24 | -37:10:12 | - | 497 sq. deg. |
| | | A constellation containing many magnificent open clusters, globular clusters and nebulae, and sits amongst some of the richest star fields of the Milky Way. It is a excellent imaging target and when imaged well will produce results of great beauty. If you are fortunate enough to have a large format camera it will make a great picture to hang in your living room. | | | | | | ☻N S 3 | |
| 88 |  | Sinus Iridum | Bay of Rainbows | Zodiacal | Moon Mare | 32°W | 45°N | | 411 km: 4' |
| | | The very name 'Bay of Rainbows' conjures up a vista of unrivalled beauty and romanticism, and was so called by Giovanni Riccioli. The truth does not disappoint the observer who cares to look out for this landscape. It is particularly impressive when it lies close to the inky black terminator and the Montes Jura seem to glisten like jewels as sunlight begins to fall on their peaks. A wonderful object and a favourite amongst lunar imagers. | | | | | | ☻N S 3 | |
| 89 |  | SMC/NGC292 | Small Magellanic Cloud | DSO: Barred Spiral/Irregular Galaxy | Tucana | 00:53:40 | -72:48:34 | 2.7 | 5°x3° |
| | | The SMC or Small Magellanic Cloud is like its 'big brother' a nearby neighbour of our own Milky Way laying at a distance of 200,000 light years. It is one of the 'showcases' of the Southern Hemisphere. It has a low surface brightness and is best viewed or imaged away from city lights and under a dark sky. | | | | | | ☻S 3 | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 90 |  | Solar Prominences | | Sun | Zodiacal | | | - | - |
| | | A Solar Prominence is a magnificent and awe inspiring sight. It is a bright feature extending outwards from the surface of the Sun, often in a loop configuration, and best seen against the limb. It consists of hot ionized gas (plasma) ejected from the Solar Photosphere extending many thousands of kilometers. The largest Prominence observed was over 350,000 km. | | | | | | ☺N S 5 | |
| 91 |  | Sunset | | Earth | Zodiacal | | | - | |
| | | A Sunset is one of nature's most colourful spectacles, exhibiting an untold variety of hues, textures and shapes. It gives the photographer an extraordinary degree of freedom in the type of image produced, the location, the angle of the shot, and theme can all be chosen carefully in order to achieve the desired result. A sunset over the sea, in a forest or over a mountain can all produce a final image of untold beauty. | | | | | | ☺N S 1 | |
| 92 |  | Solar Photosphere | | Sun | Zodiacal | | | - | - |
| | | The Sun is a star and gives the imager and amazing opportunity to photograph what is after all – a controlled atomic bomb. Solar Imaging gives the beginner the opportunity to learn new techniques and probably new equipment as well, and to overcome the problem of taking exposures of an object that is intensely bright. In the early days of astrophotography this involved the use of a spring loaded shutter held back by a string and released by burning through the string with a candle!. So when you have problems imaging the Sunspots think how lucky you are! | | | | | | ☺N S 2 | |
| 93 |  | Tornado | Twister | Earth | | | | - | - |
| | | A Tornado is one of nature's most destructive forces and one of the 'A' Lists greatest challenges. They have been observed on every continent with the exception of Antarctica, but mostly in the USA. Southern Canada, south central and eastern Asia, east central South America, Southern Africa, north western and south eastern Europe, and western and south eastern Australia and New Zealand. Don't get too close to one in effort to get the *'perfect shot'*. | | | | | | ☺N S 5 | |
| 94 |  | Total Solar Eclipse | | Sun | Zodiacal | | | -26.7 | 31.6' – 32.7' |
| | | A Total Solar Eclipse is undoubtedly one of the greatest sights anyone can see in a lifetime. At least two and up to five Solar Eclipses can occur each year, with between zero and two being total. Observing and imaging a Total Solar Eclipse is difficult not only from the technical perspective, but also because of the logistics of finding one and travelling to where it can be seen. Unlike a Total Lunar Eclipses, Total Solar Eclipses can only be seen along a very narrow corridor on the Earth's surface. So it may be you will have to travel thousands of miles to a remote part of the Globe to get your shot. Also to depress you even more, Totality only lasts a maximum of 7 minutes and 31 seconds, and is often much less, just three or four minutes. There is very little room for error or faulty equipment. Sorry! | | | | | | ☺N S 5 | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 95 |  | Venus | Morning/Evening Star | Planetary | Zodiacal | | | -3.8 to -4.6 | 9.7" to 66" |
| | | A much easier target than the last! Don't expect to see any detail on the planet's surface, still an object of great beauty. | | | | | | ☺ ☻N S 2 | |
| 96 |  | Virgo Cluster | | DSO: Galaxy Cluster | Virgo/Coma Berenices | 12:27:00 | +12:43:00 | - | $8^{o}$ |
| | | A cluster of approximately 1300 galaxies (and possibly as many as 2000) situated at a distance of some 59 +/- 4 million light years in the constellations of Virgo and Coma Berenices. A number of the brighter members including M87 were included in Messier's catalogue. See how many you can capture in your image. | | | | | | ☻N S 3 | |
| 97 |  | X102 | Northern Coalsack | DSO: Dark Nebula | Cygnus | 21:40:00 | 41:00:00 | - | $8^{o}$x$5^{o}$ |
| | | An object that is hardly known, and does not seem to appear on the pages of any modern sky charts. In fact I suspect that Southern Hemisphere observers believe that they are the only ones to have a Coalsack. This is not true, in the constellation of Cygnus amongst its Milky Way stars lies another one. | | | | | | ☻N 3 | |
| 98 |  | X106/NGC 7380 | Harry Potter's Golden Snitch | DSO: Open Cluster + Nebula | Cepheus | 22:47:21 | +58:07:54 | 7.2 | 20' |
| | | Caroline Herschel, who also the first professional woman astronomer discovered NGC 7380 in 1787. William and Caroline Herschel believed it to be an ordinary cluster of coarse scattered stars 8' across. The truth as shown in long exposure photographs is that it is bathed in a beautiful cloud of Nebulosity, inside of which stars may still be forming. | | | | | | ☻N 3 | |
| 99 |  | X15/NGC 1333 | Embryo Nebula | DSO: Reflection Nebula | Perseus | 03:29:18 | +31:25:00 | 5.7 | 3'x6' |
| | | A small and compact reflection nebula situated in an active star formation region of the Perseus molecular cloud complex. A much neglected object which few even know of, even less observe it, and hardly anyone images it. Yet it is a most beautiful object first discovered in 1858 believe it or not with the aid of a 3.1" Refractor by Eduard Schonfeld of Bonn. | | | | | | ☻N S 3 | |
| 100 |  | X17/NGC 1365 | | DSO: Barred Spiral Galaxy | Fornax | 03:33:37 | -36:08:27 | 9.5 | 6'x11' |
| | | A most magnificent Barred Spiral Galaxy and the equal of our Milky Way in size. It is brighter and further North than NGC 1300 which makes it an easier target for those living in Northern Europe and the mainland USA. It however it is as perfect in its symmetry as NGC 1300 which is the archetypal of all 'Barred Spirals'. | | | | | | ☻N S 3 | |

# The Astrophotographers' – 'A' List of Imaging Targets

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 101 |  | X19/NGC 1398 | | DSO: Barred Spiral Galaxy | Fornax | 03:38:52 | -26:20:14 | 9.5 | 5'x8' |
| | | The third Barred Spiral Galaxy in the 'A' List, and an object of simplistic symmetry, a central bar and bulge surrounded by spiral arms which are reminiscent of coiled ropes. NGC 1398 has been known to have had at least one supernova in recent times - SN1996N. You never know not only will you have an image of a beautiful galaxy you might also capture a supernova! I personally imaged a supernova in M51 a day before it was officially discovered, hope you have better luck! | | | | | | ☻N S 3 | |
| 102 |  | X3/NGC 281 | Pacman Nebula | DSO: Emission Nebula | Cassiopeia | 00:52:54 | +56:37:30 | 7.8 | 30'x35' |
| | | NGC 281 was another discovery of the great pioneer Edward Emerson Barnard, who in 1881 observed this magnificent object for the very first time. There is an extra bonus to this object in that it has an associated open cluster IC 1590, which adds to the overall impact of the captured image. | | | | | | ☻N 3 | |
| 103 |  | X32/NGC 1977 | Running Man Nebula | DSO: Reflection Nebula | Orion | 05:35:18 | -04:49:15 | 6.3 | 20' |
| | | NGC 1977 is probably the finest reflection nebula in the whole heavens, and was one of the many discoveries of the great 18th century astronomer Sir William Herschel. It is aptly named because long exposure images do capture what looks like a man running through a ghostly celestial mist of the most beautiful shades of what is almost purple-lilac in colour. | | | | | | ☻N S 3 | |
| 104 |  | X34/NGC 2024 | Flame Nebula | DSO: Emission Nebula | Orion | 05:41:42 | -01:51:24 | 7.2 | 30' |
| | | Another magnificent treasure to be found in the constellation of Orion. Totally different from the previous entry but nevertheless just as impressive. In this case the 'centerpiece' is what looks like a burning bush of what I can only describe as Flamingo Pink. The view is made all the more impressive by the presence of the nearby star Alnitak. | | | | | | ☻N S 3 | |
| 105 |  | X37/NGC 2175 | | DSO: Emission Nebula | Orion | 06:09:39 | +20:29:18 | 6.9 | 30' x 40' |
| | | An object missed by everyone until 1857 when Carl Bruhns discovered this gorgeous Emission Nebula with a small 'comet' sweeper at the Berlin Observatory. NGC 2175 is a neglected object rarely observed or even known about, which is a great pity considering it is such a 'Hidden Treasure' (X37 in Stephen O'Meara's List'. I wonder if it would have been neglected if it has been at the same distance as M42, then it cover 3 degrees of sky and shine at magnitude 5. | | | | | | ☻N S 2 | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 106 |  | X38/NGC 2264 | Christmas Tree Cluster | DSO: Open Cluster + Nebula | Monoceros | 06:40:58 | +09:53:44 | 4.1 | 40' |
| | | This is an object best imaged at Christmas, not only because of the constellation in which it is found, but also because in long exposure images it closely resembles a Christmas Tree complete with lights, only in this case the tree is a gorgeous shade of 'Santa Claus' Red. Be warned this is a difficult object to image being very faint – a present you have to earn. | | | | | | ☻N S 4 | |
| 107 |  | X54/NGC 3293 | Little Jewel Box | DSO: Open cluster + Nebulosity | Carina | 10:35:51 | -58:13:48 | 4.7 | 5' |
| | | Although not as famous as the open cluster NGC 4755 (the Jewel Box) this is an object that deserves to be called the 'Real Jewel Box'. NGC 3293 sits in the centre of a cloud of nebulosity, which when captured in long exposure CCD images creates a vista of jewels laid out on a cloth of the finest purple-red satin. Image it and you will see what I mean! | | | | | | ☻S 2 | |
| 108 |  | X63/NGC 4490 | Cocoon Galaxy | DSO: Peculiar Barred Spiral Galaxy | Canes Venatici | 12:30:36 | +41:38:34 | 9.5 | 3'x6' |
| | | The constellation of Canes Venatici holds more galactic treasures than even Virgo, Leo and Coma Berenices. NGC 4490 is one of many, it forms a pair an interacting pair with its near neighbour NGC 4485, and gets its name from long exposure images which show its core to be wrapped in a cocoon of HII regions and stellar associations. | | | | | | ☻N 3 | |
| 109 |  | X88/NGC 6520 | Dead Man's Chest Cluster | DSO: Open Cluster + Dark Nebula | Sagittarius | 18:03:25 | -27:53:28 | 7.6 | 5' |
| | | Like NGC 3293, NGC 6520 is an open cluster embedded in nebulosity, but there the similarity ends. Whereas NGC 3293 is 'jewel like', the field of view surrounding this object is dark and almost 'deathly' hence the name given to it by Stephen James O'Meara. | | | | | | ☻N S 3 | |

# The Astrophotographers' – 'A' List of Imaging Targets

**NOTES:**

In order to help the imager in his quest to image all 109 objects in the 'A' List, each item will be defined by a number of characteristics, and in particular:

- **List ID**: denoted by 'A' followed by a number 1 to 109, e.g. A2 is an Aurora and A3 is Barnard 33 – the 'Horse Head' Nebula;
- **Image**: a black and white picture of the object; it has been left up to the imager to find the object's true colour (if any!);
- **Name**: the catalogue(s) name of the object if any, e.g. C14/NGC 869 + 884 – denoting Caldwell Object 14 or NGC 869 + 884 – the 'Double Cluster in the constellation of Perseus;
- **Common Name**: if the object has one, e.g. 'Great Orion Nebula' for M42;
- **Type**: i.e. DSO, Earth, Historical, Moon, Planetary and Sun; DSOs are further classified as galaxy, emission nebula, planetary nebula etc;
- **Constellation**: if applicable;
- **RA, Dec**: if applicable, in the case of Moon objects the lunar latitude and longitude is given;
- **Magnitude**: if applicable;
- **Size**: angular size of object if applicable;
- **Visibility**: denoted by the symbols '☺' Day and '☻' for Night;
- **Location**: N for Northern hemisphere and S for Southern hemisphere; a DSO is classed as Northern if its declination is > 45 degrees and Southern if less than -45 degrees. A DSO with a declination between 45 and -45 is classed as NS. Earth based objects are classed as N or S depending upon the their latitude North or South of the Equator;