

DEEP SKY

Get face-on to SPRING'S GALAXY WONDERS

Spring-time means galaxies, and those spiral island universes that appear face-on provide wondrous and irresistible targets for visual observers and imagers alike, writes Mark Armstrong.

■ NGC 3184 shows a very attractive face-on spiral pattern. Image: Ronald Brecher.

NGC 3184

RA	DEC	MAG	SIZE
10h 18m 17s	+41° 25' 27"	+9.8 (sfc. br. 13.8)	6.9' × 6.8'

The deep sky in the spring-time is dominated by an almost endless supply of galaxies, including featureless elliptical behemoths like Messier 87 (see *Highlights* on page 57) in Virgo and striking, edge-on slivers such as NGC 4565 in Coma Berenices. However, I suggest there's nothing quite to compare with galaxies that exhibit face-on to our line-of-sight, manifestly revealing their multiple, sweeping spiral arms to majestic effect.

Messier 51, the wonderful Whirlpool Galaxy in Canes Venatici, is the leading light in this category that every deep-sky observer is familiar with. However, as this month's tour demonstrates, there are many more to choose from, including the six gems I've chosen here. In addition, I've picked out half a dozen great face-on spirals ripe for imaging, three of which lie in the southern sky and make superb targets for remote imagers.

NGC 3184: the best in the NGC?

Ursa Major, the Great Bear, is one of the best constellations for hunting down galaxies of all shapes, sizes and brightness. Messier 81 and Messier 101, the

Pinwheel Galaxy, are magnificent objects that dominate its territory.

Let's start our tour with NGC 3184, arguably the Great Bear's second-best face-on spiral galaxy; it's acquired the nickname of the Little Pinwheel Galaxy, so it must have a lot going for it. It is really a rather beautiful object, with deep images revealing two blue and luminous spiral arms uncurling from a small, yellowish core. Across its circular 6.9' × 6.8' form these spiral arms branch out in several places to give it an overall sprawling spiral pattern (morphological classification SAB(rs)cd).

NGC 3184 shines at magnitude +9.8, although, as with all face-on spiral galaxies, this encouraging number is tempered by the affliction of the low surface brightness (sfc. br.) of its spiral arms. It can

be found through a 100mm (four-inch) telescope as a featureless glow spanning around four arcminutes across. Try high powers and averted vision to glimpse an unevenly bright surface when scrutinising it through a 250–300mm (ten- to twelve-inch) telescope.

NGC 3184 is circumpolar (never setting) from the UK and is easy to track down in Ursa Major's southernmost reaches, close to the boundary with Leo Minor. It lies 45 arcminutes west of magnitude +3 Tania Australis (mu [μ] Ursae Majoris [UMa]). Around mid-month, NGC 3184 lies high-overhead, at close to culmination across the UK, as true astronomical darkness falls between about 10 and 11pm BST.



■ NGC 3344 exhibits classic spiral arms surrounding a tiny, star-like core. Image: Bernard Hubl.

NGC 3344			
RA	DEC	MAG	SIZE
10h 43m 30s	+24° 55' 24"	+10.0 (sfc. br. 14.0)	6.9' × 6.5'

NGC 3344: a gem languishing in Leo Minor

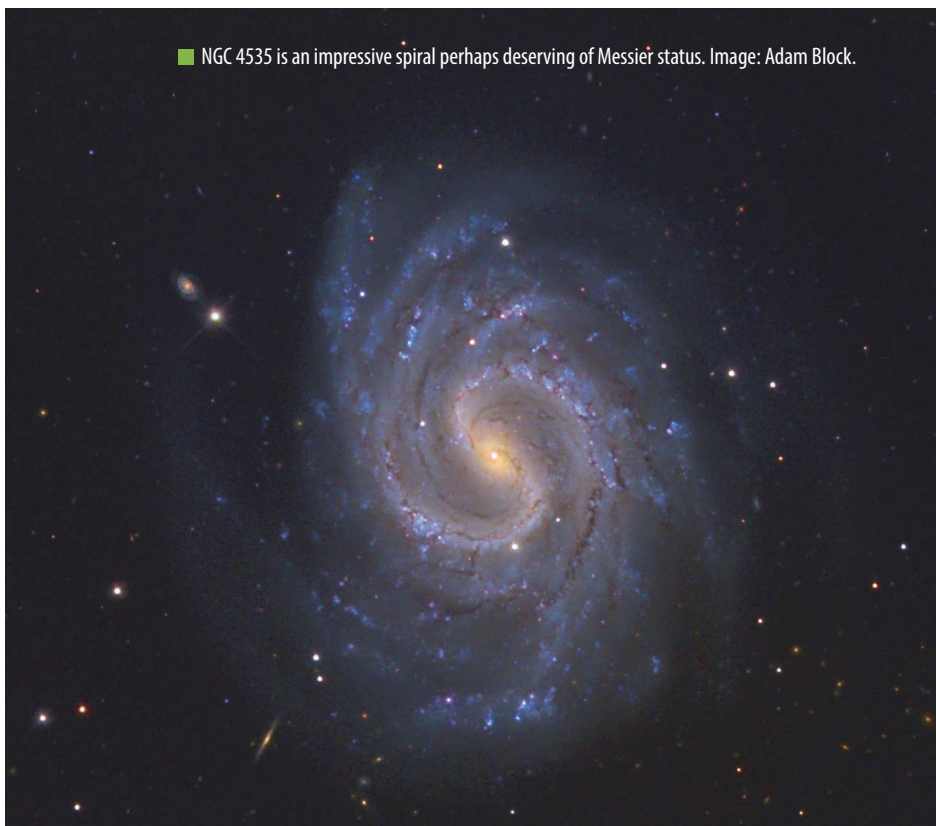
Unfashionable Leo Minor is a rather forlorn constellation that's overwhelmed by the mighty constellations of Ursa Major and Leo, lying to its north and south respectively. In common with its heavyweight neighbours, the Little Lion deals principally in galaxies and hosts two fine face-on examples in NGC 3344, our tour's next stopping-off point, and NGC 3486, which is an exceptional imaging target that features later on.

NGC 3344 is a weakly-barred spiral (SAB(rs)cd) that is the just about the largest and brightest galaxy in Leo Minor. Shining at magnitude +10.0, it covers a not insubstantial 6.9' × 6.5', very close to the dimensions of NGC 3184, although it's slightly more oval-shaped. NGC 3344 can be located through an

80–100mm (~three- to four-inch) telescope as a uniformly illuminated patch of light. Images show NGC 3344's stellar-like core surrounded by multiple spiral arms.

NGC 3344 lies close to Leo Minor's southern boundary, six degrees east of magnitude +3.4 Alhafera (zeta [ζ] Leonis), and midway between the fifth-magnitude stars 40 and 41 Leonis Minoris. At mid-month, NGC 3344 crosses the southern meridian (culminates) at an elevation of around 60 degrees between 10pm to 10.30pm BST.

■ NGC 4535 is an impressive spiral perhaps deserving of Messier status. Image: Adam Block.



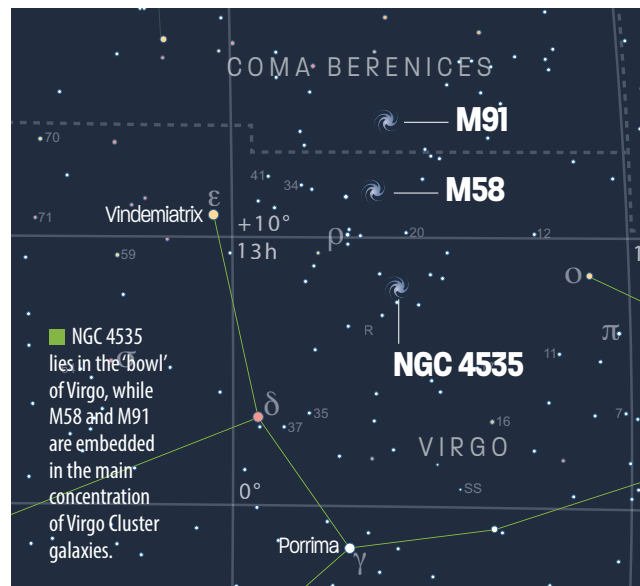
NGC 4535

RA	DEC	MAG	SIZE
12h 34m 20s	+08° 11' 53"	+10.0 (sfc. br. 13.6)	6.8' × 5.0'

NGC 4535: an unsung Virgo classic

The contrast couldn't be greater now as we move south-eastwards from obscure Leo Minor and into celebrated Virgo. Its territory, together with that of Coma Berenices to the north, hosts the Virgo Cluster of galaxies, the finest grouping of bright galaxies in the entire sky.

The next galaxy we visit is magnitude +10.0 NGC 4535, a member of the Virgo Cluster that's an impressive, multi-armed face-on spiral. It's a tough object to see well through a small telescope, though a 150mm (six-inch) telescope



should locate it on a good night. However, fine detail, in the form of its low-contrast spiral arms, spreads out over 6.8' × 5.0' and will probably evade detection through all but a large telescope; a 300mm (12-inch) telescope shows the halo extending to about 6' × 4', with some brightness variations in its outer regions. Do you think it merits a place in Charles Messier's catalogue?

NGC 4535 is found a few degrees south of the main galaxy conglomeration, which straddles the boundary between Virgo and Coma. Located just inside the 'bowl' of Virgo, it lies just 27 arcminutes north of magnitude +6.7 star HIP 61366; zooming out, NGC 4535 sits some seven degrees south-west of magnitude +2.8 Vindemiatrix (epsilon [ε] Virginis). It culminates at around midnight BST at a decent altitude of between 42 and 46 degrees. Before heading for our next tour target, take some time to observe Messier 49 (NGC 4472), a large elliptical galaxy lying just over a degree to the west.

Messier 58: an under-observed beauty

We remain in Virgo and need to look just 3.7 degrees north from NGC 4535 to land on the Virgo Cluster member Messier 58 (NGC 4579), a fairly unappreciated face-on spiral that's the fourth stop on our tour.

Messier 58, one of only four barred spiral galaxies (morphological classification SAB(rs)b) in Messier's list (M91, our next object, is one too), has a catalogued magnitude of +9.8 and rates the highest surface brightness on our tour to date. In deep images its generous dimensions stretch to 5.4' × 4.4'. An 80mm (~three-inch) telescope shows it as a faint, 2' × 1' east to west orientated glow, which expands to a 4' × 3' halo, with a well-defined core, through a 150mm (six-inch) telescope. Messier 58 lies around 1.5 degrees south of the Virgo-Coma boundary and nearly two degrees north-west of rho (ρ) Virginis (+4.9).

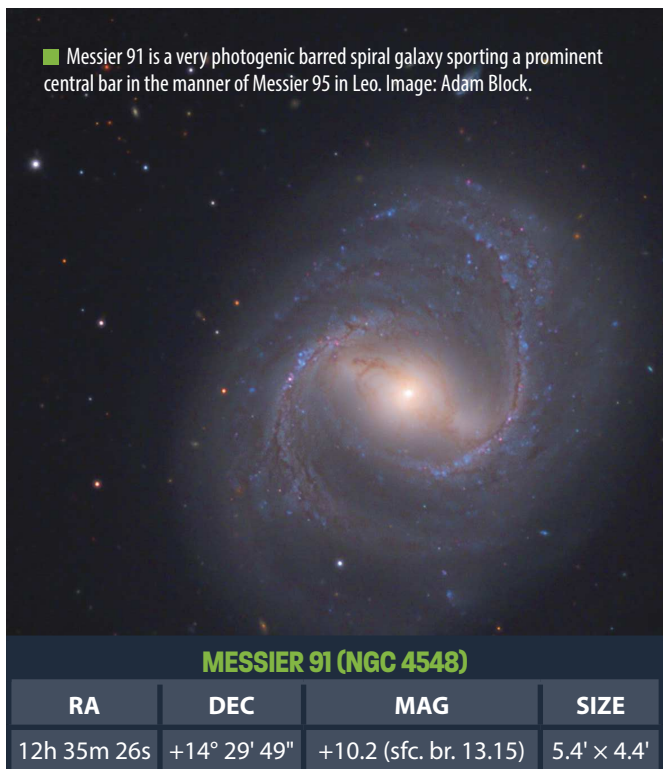
MESSIER 58 (NGC 4579)

RA	DEC	MAG	SIZE
12h 37m 44s	+11° 49' 11"	+9.8 (sfc. br. 13.1)	5.4' × 4.4'



■ Messier 58 is a barred spiral galaxy sporting well-defined and ordered spiral arms. Image: Adam Block.

■ Messier 91 is a very photogenic barred spiral galaxy sporting a prominent central bar in the manner of Messier 95 in Leo. Image: Adam Block.



MESSIER 91 (NGC 4548)

RA	DEC	MAG	SIZE
12h 35m 26s	+14° 29' 49"	+10.2 (sfc. br. 13.15)	5.4' × 4.4'

Messier 91: a splendid barred spiral

We head further north to look for our penultimate target on this month's tour. Messier 91 (NGC 4548) lies just inside the southerly reaches of the territory of Coma Berenices, around 2.7 degrees north of Messier 58. It's a confirmed member of the Virgo Cluster, with a distance of about 52 million light years. Although Messier 100 (NGC 4321) is perhaps Coma's archetypal face-on spiral, deep images show Messier 91 has a pronounced central bar (SBb[rs]), rather like that of Messier 95 in Leo, which makes it a very attractive object. Certainly, its profile deserves to be lifted to be on a par with that of the nearby spirals Messier 88 and 99.

Messier 91's magnitude is around +10.2 and it spans 5.4' × 4.4', identical to Messier 58 though it has a slightly lower surface brightness than its rival in Virgo. Messier 91 has the reputation of being the most difficult object in the Messier catalogue to observe visually. Indeed, it could be beyond the range of 10 × 50 binoculars, though I'm sure eagle-eyed and experienced observers observing under a pristine sky may say different. Our late and lamented colleague Neil Bone stated that he could barely glimpse it with averted vision through his 80mm refractor under a dark sky.

A 150mm (six-inch) telescope can reveal it to be orientated slightly south-east to north-west (a position angle on the sky of 155 degrees), with a smooth halo and a bright core. A 250–300mm (10- to 12-inch) telescope, operating on a transparent and moonless night under a dark sky, should be sufficient to hint at M91's central bar. Messier 91 lies about a degree west of magnitude +7 star HIP 61728 and culminates at an altitude of over 50 degrees at about the same time as Messier 58 and NGC 4535, our previous targets in Virgo.

Before leaving the area, nudge your telescope about 50 arcminutes west and then a further 3.2 degrees west again to observe Messier 88 and Messier 99, respectively. How well does Messier 91 stack up against them do you think?

Messier 94: an attraction out of the top-drawer

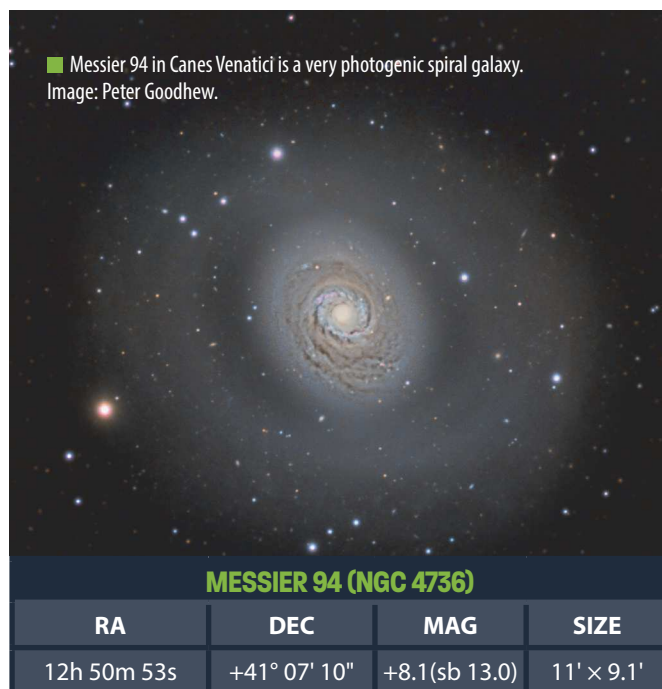
We finish our tour on a very high note by paying a welcome visit to Messier 94 (NGC 4736) in Canes Venatici, the Hunting Dogs, home of the Whirlpool Galaxy (Messier 51).

Messier 94 has a similar declination (~41 degrees) to NGC 3184 in Ursa Major, where we began our tour. This places it roughly at the centre of the constellation, 26 degrees north of Messier 91. Sweep for it three degrees north-north-west of magnitude +3 Cor Caroli (alpha [α] Canum Venaticorum). Messier 94 is circumpolar (never setting) from the UK and culminates not long after midnight BST at the very advantageous altitude of between 75 and 80 degrees

Messier 94 is the largest and brightest spiral on our tour by some distance, weighing in at magnitude +8.1 and covering 11' × 9.1'. Neil Bone observed it through his 80mm refractor and reported it as 'compact, circular and only slightly fuzzy, with good contrast against the sky'. He also rated M94 as 'quite an easy binocular object'.

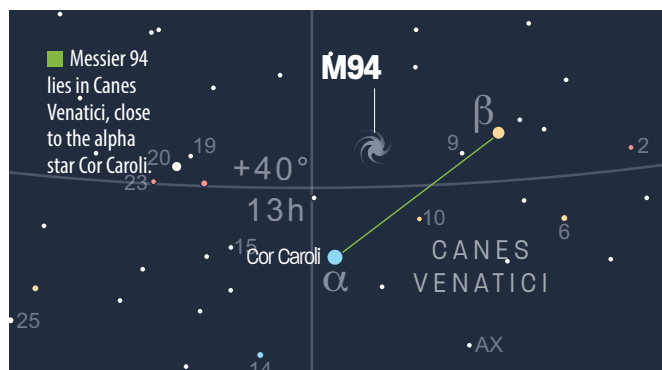
Deep amateur images show a double-ring structure that probably won't be visible in anything other than a light-bucket Dobsonian, especially a very faint outer ring. A telescope in the 150mm (six-inch) class can reveal a bright, mottled core with perhaps first impressions of an inner shell.

■ Messier 94 in Canes Venatici is a very photogenic spiral galaxy. Image: Peter Goodhew.



MESSIER 94 (NGC 4736)

RA	DEC	MAG	SIZE
12h 50m 53s	+41° 07' 10"	+8.1(sb 13.0)	11' × 9.1'



■ Messier 94 lies in Canes Venatici, close to the alpha star Cor Caroli.

SOME SUPERB SOUTHERN SPIRALS

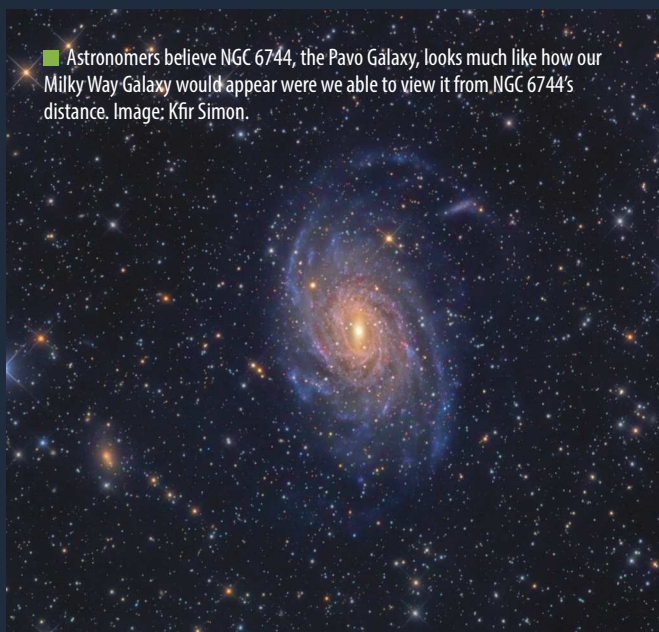
With remote imaging platforms becoming ever more popular (see *Deep sky, AN*, February 2022), why not log-on and image some of the tremendous face-on spirals that live in the southern sky. Space constraints permit a wider selection, but here's a likely trio for this time of the year: Messier 83 (NGC 5236), the Southern Pinwheel in Hydra; NGC 6764, the Milky Way lookalike Pavo Galaxy; and NGC 2997 in Antlia. Of course, you may have your own particular favourites.

MESSIER 83: THE SOUTHERN PINWHEEL

RA	DEC	MAG	SIZE
13h 37m 00s	-29° 52' 04"	+8.2	10' × 11'

■ Messier 83 in Hydra is one of the finest and most photogenic face-on spiral galaxies in the entire sky. Image: Kfir Simon.

■ Astronomers believe NGC 6744, the Pavo Galaxy, looks much like how our Milky Way Galaxy would appear were we able to view it from NGC 6744's distance. Image: Kfir Simon.



NGC 6744: THE PAVO GALAXY

RA	DEC	MAG	SIZE
19h 09m 45s	-63° 51' 27"	+9.1	20.1' × 12.9'

■ NGC 2997 is a superb galaxy that lies in the bizarrely-named southern constellation of Antlia, the Air Pump. Image: Adam Block.



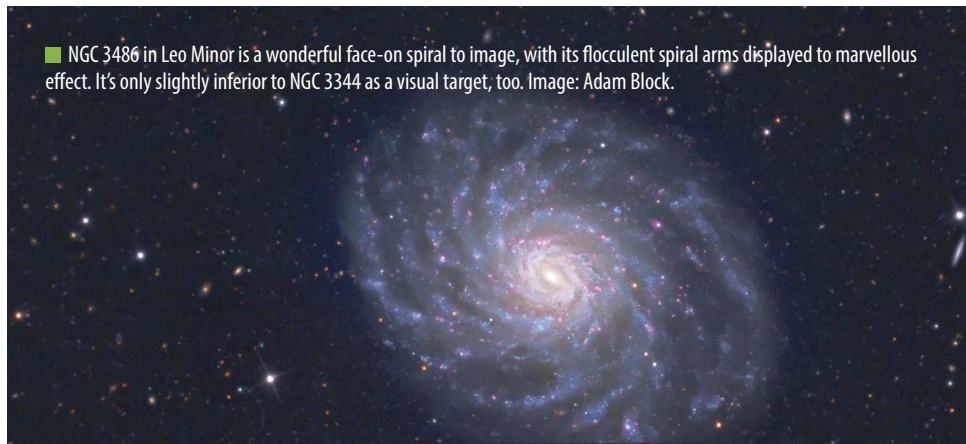
NGC 2997: ANTLIA'S GRAND-DESIGN SPIRAL

RA	DEC	MAG	SIZE
09h 45m 39s	-31° 11' 23"	+10.1	9.2' × 7.4'

Inviting images from home

It is a tremendous thrill to see the faint form of a distant galaxy through the eyepiece, the endpoint for photons emitted by that galaxy millions of years ago and that have travelled across the vastness of intergalactic space. However, amateur astronomers can only see the full picture for the overwhelming majority of galaxies by imaging them. Here's three great face-on spiral galaxies that look great on the computer screen.

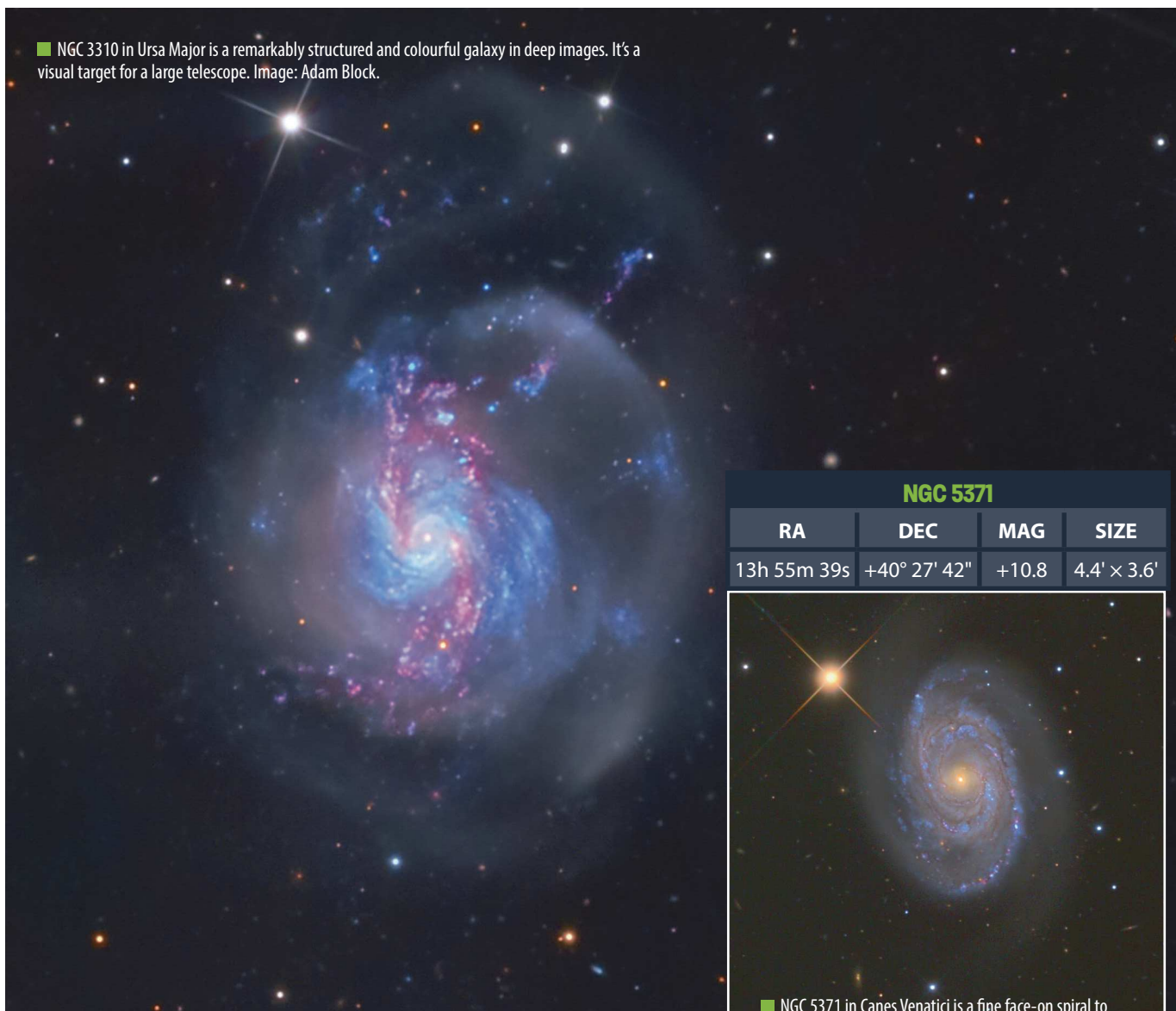
■ NGC 3486 in Leo Minor is a wonderful face-on spiral to image, with its flocculent spiral arms displayed to marvellous effect. It's only slightly inferior to NGC 3344 as a visual target, too. Image: Adam Block.



NGC 3486

RA	DEC	MAG	SIZE
11h 00m 23s	+28° 58' 29"	+10.3	6.9' × 5.4'

■ NGC 3310 in Ursa Major is a remarkably structured and colourful galaxy in deep images. It's a visual target for a large telescope. Image: Adam Block.




NGC 3310

RA	DEC	MAG	SIZE
10h 38m 44s	+53° 30' 16"	+11.1	3.6' × 3.0'

NGC 5371

RA	DEC	MAG	SIZE
13h 55m 39s	+40° 27' 42"	+10.8	4.4' × 3.6'



■ NGC 5371 in Canes Venatici is a fine face-on spiral to image, with its blue spiral arms contrasting nicely with a golden core. Visually, telescopes in excess of 150mm (six inches) in aperture can reveal it. Image: Adam Block.