

FEATURE CONSTELLATION: URSA MAJOR

BY CHRIS BECKETT

*The great Ulysses spread his canvas joyfully to catch the breeze,
And sat guided with nice care the helm,
Gazing with fixed eye on the Pleiades,
Boötes setting late, and the Great Bear,
By others called the Wain, which, wheeling round,
Looks ever toward Orion, and alone
Dips not into the waters of the deep.*

—Homer's *Odyssey*

The Big Dipper, an asterism in Ursa Major (UMa), is one of the first star patterns people learn, because the outer bowl stars point to the North Star (Polaris, see p. 20), essential to finding one's way around the constellations. Ursa Major bore a greater resemblance to a bear 125 000 years ago than it does today (see p. 21)—the dominant stars have been viewed also as a wagon, a plough, and a dipper. The Ursa Major Moving Group is also called the open cluster Collinder 285; the easiest constituents to identify are the five innermost Dipper stars: Merak, Phecda, Megrez, Alioth, and Mizar along with several others spread around the sky, such as β Aur and α CrB, all some 80 ly from Earth, moving together through space towards Sagittarius, as Olcott said “like a flock of geese flying across the heavens” (see arrows in the figure, below).

Our tour begins at ξ UMa (Alula Australis, mag. 3.8), the southernmost bright star of the back paw. This was the first binary star discovered (William Herschel, 1780) and the first to have an orbit calculated (Savary, 1828). Panning a good binocular field to the northwest, we come to a Milky Way “thick disk” star Lalande 21185 (mag. 7.5).

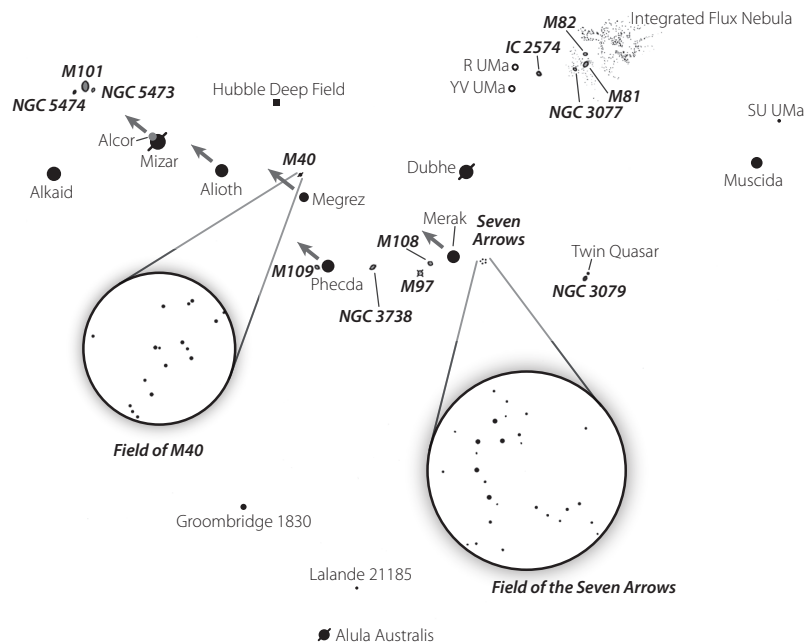


illustration by Randall Rosenfeld

This red dwarf, the fifth-nearest star to our Sun (8.3 ly, see p. 289) appears reddish-orange to the eye. Tacking northeast, we find Groombridge 1830 (mag. 6.4), the star with the highest proper motion after Barnard's and Kapteyn's; to the north are two edge-on galaxies NGC 4088 and NGC 4157, with NGC 4085 in a 1° field (not in the figure, see p. 319). Now head to Phecda, where less than 1° east we find our first Messier object, M109, the brightest member of the Ursa Major Cluster of galaxies.

From Phecda, cross the bowl through Dubhe and proceed the same distance to find three GALAXIES WITH PROPER NAMES (see p. 335): M81 and M82, or Bode's Nebulae (Johann Bode, 1774), which fit in the same low-power field of most telescopes (try for nearby NGC 3077, mag. 10.4); and, just 2° further, IC 2574, Coddington's Nebula, a dwarf galaxy in the group, home to bright star-forming regions visible in smaller telescopes. While sweeping around this area under the darkest skies, look for evidence of the Integrated Flux Nebula (see WIDE FIELD WONDERS p. 329).

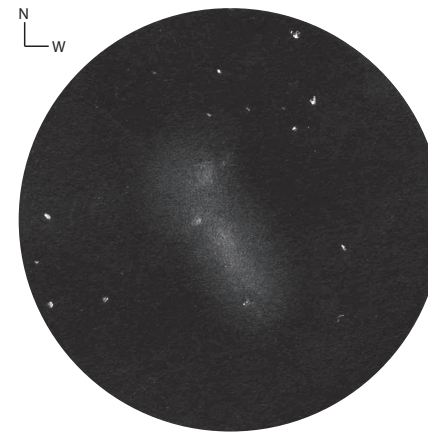
To the east is VY UMa (mag. 5.7–6.3), a red carbon star (see p. 295). About 1.5° north is the variable star R UMa (mag. 7.5–13.0), a long-period variable (see p. 299). The two variables fit inside a 2° field with IC 2574. Another variable to check out is SU UMa (RA 8h 12.5m Dec $+62^\circ 36.4'$), a rare cataclysmic star (see p. 302), with magnitude range 10.8–16.0. For another stellar point of interest, head southeast to spiral galaxy NGC 3079, where observers using large telescopes hunt just to the north for the famous Twin Quasar, 8 billion ly distant.

Back to the Dipper's bowl, the star-chain asterism “Seven Arrows” (Sachariassen, 1655) lies 2° west of Merak, an ideal target for binoculars. A few degrees east of Merak, with a low-power view, look for the galaxy M108 next to M97, a planetary nebula. M108 is another member of the Ursa Major Cluster of galaxies: higher powers reveal details even in small telescopes. Move the scope southeast to M97 and thread on an OIII nebular filter (see p. 65) to reveal details in the “Owl Nebula,” so named from the appearance of a drawing made by Lord Rosse at the “Leviathan of Parsonstown” (1.83 m). Detecting the owl eyes requires patience and dark skies.

Leaving the bowl for a tour up the handle, pause at M40, a wide pair of mag. 9 stars. Move on to Mizar and Alcor, sometimes referred to as the “Horse and Rider,” and known to the Mi'kmaq nation of Nova Scotia as “Chickadee with Birchbark Pot.” Mizar

was the first double star discovered by telescope, and the first spectroscopic binary to be detected. Alcor is moving through space with Mizar, although uncertainty remains over their orbits or gravitational binding.

We end at M101, the Pinwheel Galaxy, located using an equilateral triangle based on Mizar and Alkaid (the last star in the handle): at the peak, look for the large face-on spiral. Under a dark sky, observers using small instruments glimpse the spiral arms, while larger apertures reveal the bright HII regions NGC 5447, NGC 5461, and NGC 5462. Accompanying M101 in a 1.5° field are NGC 5473 and NGC 5474, associated galaxies from the DEEP SKY GEMS (see p. 327).



IC 2574 (Coddington's nebula)
2014 July 24 | 23:30 CST
46 cm Newtonian | Magnification: 159x
Seeing: 7/10 | Limiting Magnitude +5.9
Sketch by: Mark Bratton