

Binocular Universe: Some Royal Clusters

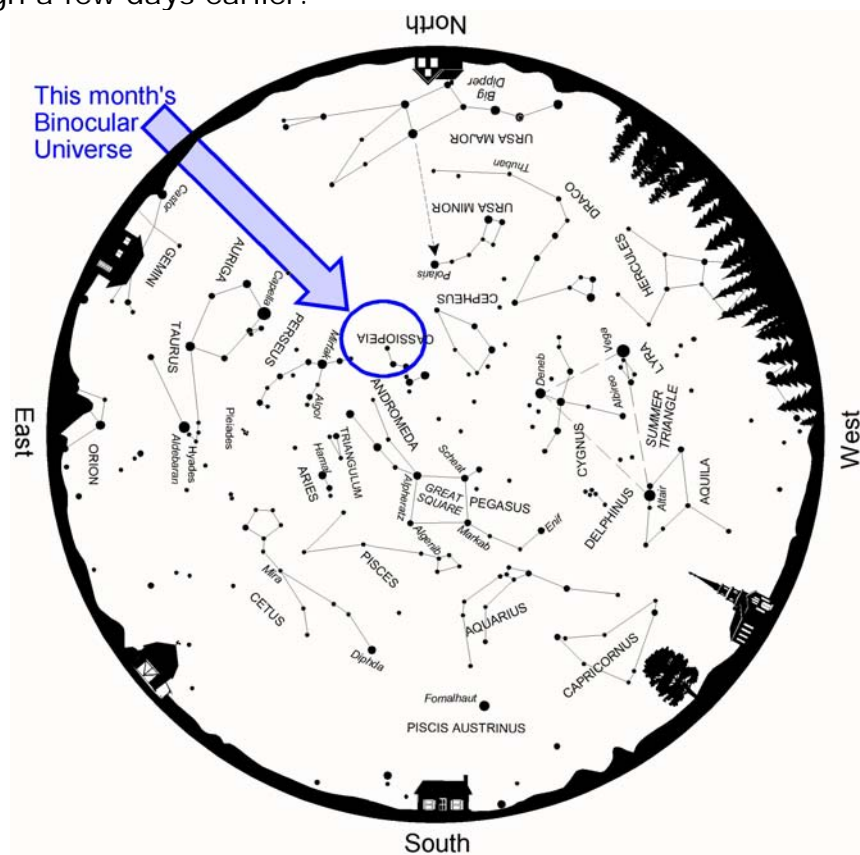
November 2011

Phil Harrington

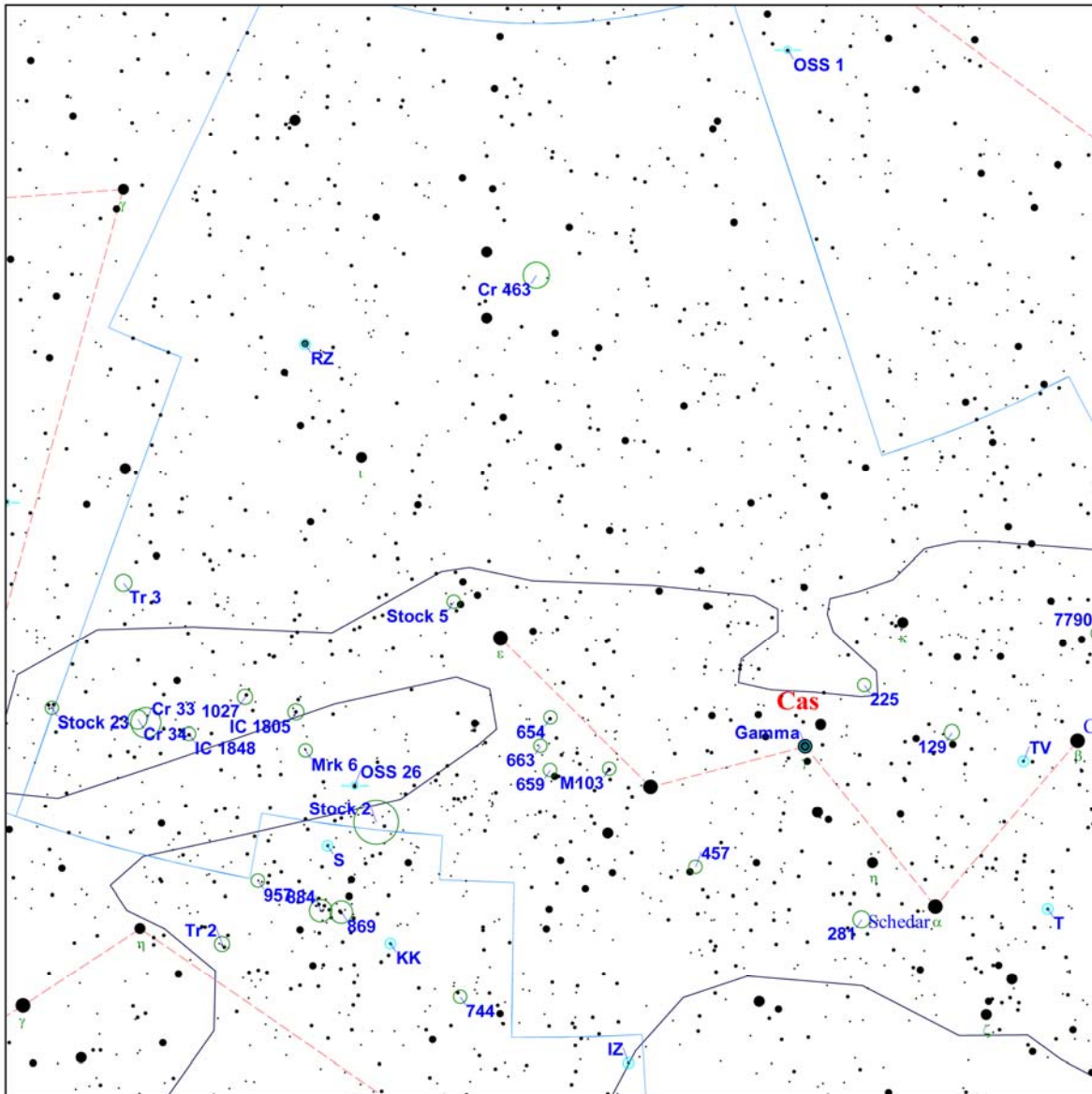


There's no denying it, my family and I are dog people. And we have three to prove it. All are wonderful...except when one wakes me up at 3 AM to take a trip outside.

That's exactly what our American Eskimo, Suzy, did a couple of months ago. Dutifully and bleary-eyed, I let her out to do what dogs have to do. But then I made the mistake of glancing up. The sky was clearer and darker than I had seen in recent memory, perhaps still in the aftermath of Hurricane Irene, which had blown through a few days earlier.



Above: Autumn star map from [Star Watch](#) by Phil Harrington.



Touring the Universe Through Binoculars Atlas
RA: 1h 43m, Dec: 65d 40m, FOV: 23d, Mag: 7.5

- | | | | |
|-------------|--------------------|-----------|------------|
| ● ≤ 1.2 | ○ Galaxy | ♿ Mercury | ♇ Pluto |
| ● 1.2 - 2.4 | ○ Open Cluster | ♃ Venus | ☀ Sun |
| ● 2.4 - 3.6 | ⊕ Globular Cluster | ♂ Mars | ☾ Moon |
| ● 3.6 - 4.9 | □ Diffuse Nebula | ♃ Jupiter | ♁ Asteroid |
| ● 4.9 - 6.1 | □ Planetary Nebula | ♄ Saturn | ☄ Comet |
| ● 6.1 - 7.3 | ○ Variable Star | ♅ Uranus | ⊛ Unknown |
| ● > 7.3 | ○ Double Star | ♆ Neptune | |

Above: Finder chart for this month's *Binocular Universe*.
 Chart adapted from *Touring the Universe through Binoculars Atlas (TUBA)*,
www.philharrington.net/tuba.htm

Sleep is cheap, so after Suzy came in, I grabbed my 10x50 binoculars and did an hour-long mini deep-sky marathon through the constellations Cassiopeia and Perseus. The views of showcase targets like M52, NGC 7789, NGC 457, and the Double Cluster were stunning. But what I really enjoyed was wandering off the beaten path just a bit to survey some of the region's less well-obvious subjects. And that's exactly what we'll do in this month's e-column.

Let's begin by aiming toward Delta (δ) and Epsilon (ϵ) Cassiopeiae in the constellation's W. These 3rd-magnitude stars are separated by just under 5° , and so fit into the same the field.

Can you see a faint fuzz just east-southeast of the midway point between them? That's **NGC 663**, a striking assembly of some 80 faint stars. Though NGC 663 weighs in at 7th magnitude, it remains unresolved when viewed through 50-mm binoculars. The brightest cluster stars can be resolved in my 16x70 binoculars, while my 25x100s show that the stars are bunched into two asymmetric clumps.

Charles Messier somehow missed NGC 663, but he did spot a second cluster nearby, about a degree northeast of Delta Cas. We know it today as **M103**. M103 holds a footnote in astronomical history as being the final object in Messier's original catalog. (M104 through M110 were subsequently added in the 20th century from Messier's unpublished notes.) His words describe M103 as simply "a cluster of stars."

Although it's not very inspirational, Messier's lackluster description probably reflects more on his telescope's quality than on M103 itself. Today's amateurs know M103 as a sparkling collection of stardust set in an arrowhead pattern measuring about 6' of arc across. Marking the tip of the arrowhead is the pretty telescopic multiple star Struve 131. Studies conclude that the association between Struve 131 and M103 is purely circumstantial, with the star lying between us and the cluster. If that's the case, then the brightest cluster star shines at magnitude 10.6, which is too faint to be resolved through most binoculars.

Now, from Epsilon Cas, scan about 1° northeast to find a V-shaped asterism of stars that remind me of a gaggle of geese in-flight. The 5th-magnitude star SAO 12076 leads the way, followed by 52 and 53 Cas as well as a few fainter goslings. Adding three dim stars just east of 53 appends a diamond pattern to the end of the flock. Three of the diamond's stars, including 53 Cas, along with another 20 or so fainter stars, collectively form open cluster **Stock 5**. Although the cluster stars are loosely packed, you might be able to detect a slightly hazy quality to that diamond, especially if you are viewing through at least 12x binoculars.

Next, swing about 8° , or a little more than a binocular field, northward to a keystone of four stars formed by 40, 42, 48, and 50 Cas. Take a careful look inside the keystone for a dim glow. That's another little-observed open cluster, **Collinder 463**. Spanning an area of sky equal in size to the full moon, Collinder 463 is made up of 80 faint stars lying some 2,100 light years from Earth. The brightest shine between 8th and 9th magnitudes.



Left: M103, NGC 663, and surroundings are seen in this sketch by Belgian amateur Rony De Laet through his 15x70 binoculars.

For a labeled version of this sketch, be sure to visit [Rony's web site](#).

Our next few targets all lie to the east of the Cassiopeia W and north-northeast of the Double Cluster. After you force yourself away from that magnificent view, center on a hazy blotch 4.5° to the north-northeast. That's **Melotte 15**, the open cluster spawned by the emission nebula IC 1805. When summed together, the 40 stars in Melotte 15 shine at magnitude 6.5, bringing it within the range of small pocket binoculars. With my 10x50s, I can count half a dozen stars within the cluster's 20 arc-minute span, with the brightest shining about 8th magnitude.

Two smaller clusters lie to either side of Melotte 15. The first, **Markarian 6**, is small and easily missed group. But look carefully and you might be able to a faint group of six stars that looks a little like an arrow aimed toward the south. **NGC 1027** lies an equal distance due east of Melotte 15. The 40 stars in this small open cluster look like a soft glow surrounding a 7th-magnitude sun. Although all three clusters appear close to one another in our sky, all three lie at very different distances. According Archinal and Hynes, authors of the book [Star Clusters](#) (Willmann-Bell, 2003), Markarian 6 is the closest at 1,665 light years away. NGC 1027 comes in second at 3,950 light years, while Melotte 15 lies a distant 7,200 light years from us.

As you can see from the chart above and the list below, this segment of Cassiopeia and adjacent Perseus contain many other star clusters visible through binoculars,

as well as some interesting variable stars. How many others can you find? Give them a try and let me know!

Object	Con	Type	R.A. (2000)	Dec	Mag	Size/Sep/ Period	Notes
Stock 23	Cam	OC	3 16.3	+60 2		15'	*TUB page 99*
OSS 36	Cam	**	3 40	+63 52	6.8,8.6	46"	69°(1923);2650
TV	Cas	Vr	0 19.3	+59 8	7.2-8.2	1.813 days	Eclipsing Binary
T	Cas	Vr	0 23.2	+55 48	6.9-13.0	444.83 days	Long Period Variable
129	Cas	OC	0 29.9	+60 14	6.5	21'	*TUB page 114*
225	Cas	OC	0 43.4	+61 47	7.0	12'	
281	Cas	OC	0 52.8	+56 37	7.4p	23'x27'	
Gamma	Cas	Vr	0 56.7	+60 43	1.6-3.0		*TUB page 114* Irr; Gamma Cas prototype
457	Cas	OC	1 19.1	+58 20	6.4	13'	*TUB page 114* Owl Cluster
M103	Cas	OC	1 33.2	+60 42	7.4	6'	*TUB page 114* NGC 581
654	Cas	OC	1 44.1	+61 53	6.5	5'	
659	Cas	OC	1 44.2	+60 42	7.9	5'	
663	Cas	OC	1 46	+61 15	7.1	16'	
Cr 463	Cas	OC	1 48.4	+71 57	5.7	36'	
Stock 5	Cas	OC	2 4.5	+64 26		15'	
Stock 2	Cas	OC	2 15	+59 16	4.4	60"	*TUB page 114-115* Muscleman Cluster
OSS 26	Cas	**	2 19.7	+60 2	6.9,7.4	63"	200°(1925)
Mrk 6	Cas	OC	2 29.6	+60 39	7.1	4.5'	
IC 1805	Cas	OC	2 32.7	+61 27	6.5	22'	
1027	Cas	OC	2 42.7	+61 33	6.7	20'	*TUB page 115*
RZ	Cas	Vr	2 48.9	+69 38	6.2-7.7	1.195 days	Eclipsing Binary
IC 1848	Cas	OC	2 51.2	+60 26	6.5	12'	
Cr 33	Cas	OC	2 59.3	+60 24	5.9p	40'	
Cr 34	Cas	OC	3 0.9	+60 25	6.8p	25'	
Tr 3	Cas	OC	3 11.8	+63 15	7.0p	23'	
7790	Cas	OC	23 58.4	+61 13	8.5	17'	
OSS 1	Cep	**	0 14	+76 2	7.6,7.9	76"	103°(1923);optical
IZ	Per	Vr	1 32.1	+54 1	7.8-9.0p	3.688 days	Eclipsing Binary
744	Per	OC	1 58.4	+55 29	7.9	11'	
RK	Per	Vr	2 10.3	+56 34	6.6-7.8		Irregular
869	Per	OC	2 19	+57 9	4.3	30'	*TUB page 199-200* Double Cluster (h Per)
884	Per	OC	2 22.4	+57 7	4.4	30'	*TUB page 199-200* Double Cluster (Chi Per)
S	Per	Vr	2 22.9	+58 35	7.9-11.5		Semi-Regular
957	Per	OC	2 33.6	+57 32	7.6	11'	
Tr 2	Per	OC	2 37.3	+55 59	5.9	20'	*TUB page 200-201*

Until we meet once again next month under the autumn sky, remember that when it comes to stargazing, two eyes are better than one.



About the Author:

Phil Harrington is the author of 9 books on astronomy, including his latest, [Cosmic Challenge](#). Be sure to visit his web site at www.philharrington.net for more information.

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