

Binocular Universe:

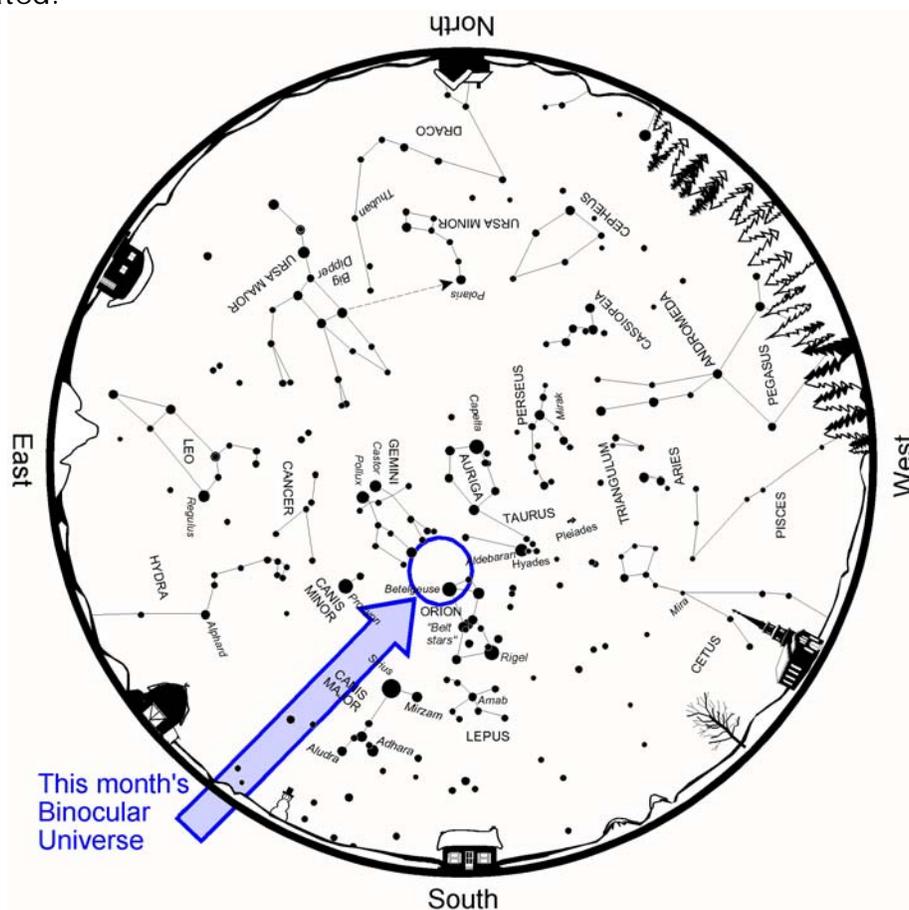
Orion's Arm

January 2013

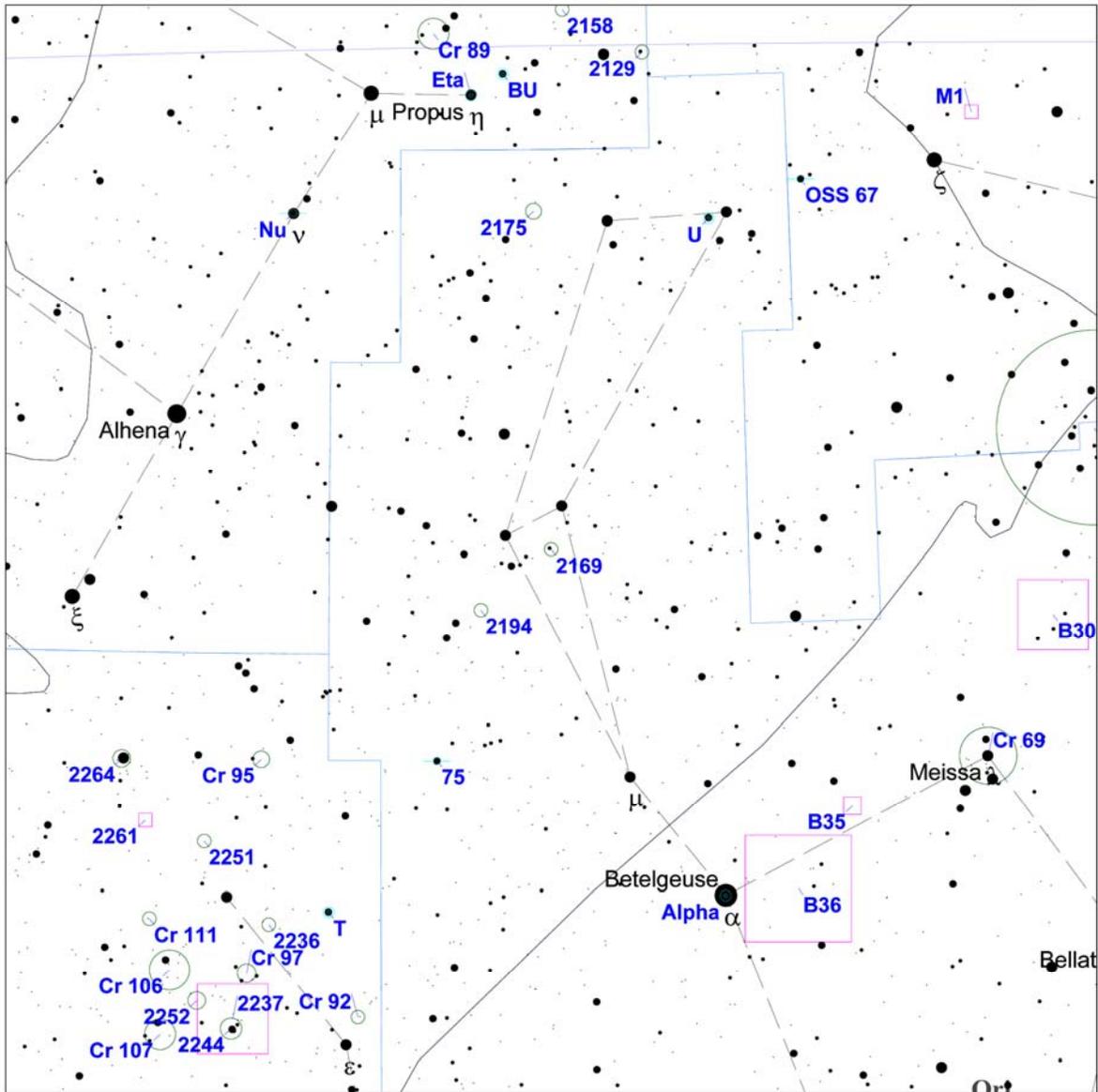
Phil Harrington



Everyone's favorite constellation, Orion the Hunter, stands tall in the January sky. He's like an old friend who returns every year just to check in and say "hello." We have visited him before in this e-column, enjoying the treasure of the Orion Nebula, M42, as well as some other sights, including M78 and his "Belt Cluster," Collinder 70. All are worth revisiting on every clear winter's night. But this time around, we are going to pay a call on some new targets that often go unappreciated.



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



Touring the Universe Through Binoculars Atlas

RA: 6h 8m, Dec: 13d 56m, FOV: 19d, Mag: 7.5

- ≤ 1.2
- 1.2 - 2.4
- 2.4 - 3.6
- 3.6 - 4.9
- 4.9 - 6.1
- 6.1 - 7.3
- > 7.3

- Galaxy
- Open Cluster
- ⊕ Globular Cluster
- Diffuse Nebula
- Planetary Nebula
- Variable Star
- Double Star

- ♿ Mercury
- ♃ Venus
- ♂ Mars
- ♃ Jupiter
- ♄ Saturn
- ♅ Uranus
- ♆ Neptune

- ♇ Pluto
- ☉ Sun
- ☾ Moon
- ♁ Asteroid
- ☄ Comet
- Unknown

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

Let's begin our visit to the Hunter with his "Alpha" star, brilliant **Betelgeuse**. While many of Orion's stars are happily fusing hydrogen into helium within their cores, Betelgeuse has been there, done that. Though estimated to be less than 10 million years old, Betelgeuse has lived life fast and furious. The hydrogen supply in its core was exhausted long ago, causing the star to swell into an enormous red supergiant. Today, heavier elements are undergoing fusion in its core. In the process, internal pressures have bloated its outer diameter. Were it centered in our solar system, Betelgeuse would extend beyond the four inner planets and continue halfway out to Jupiter. Eventually, its central process will end and Betelgeuse will go out in a burst of glory as a supernova. When will that happen? Experts tell us sometime in the next million years or so. For now, enjoy its brilliant ruby red color.

Incidentally, Betelgeuse's designation as the Alpha star in Orion makes a fun footnote in an astronomical trivia contest. When Johann Bayer originally conceived his star-designation system based on the Greek alphabet in his 1603 star atlas *Uranometria Omnium Asterismorum*, he sorted the prominent stars in each constellation in order of descending magnitude. Alpha was reserved for the brightest in each constellation, followed by Beta, Gamma, Delta, and so on. But he messed up in Orion as well as a couple of other constellations. Betelgeuse, it turns out, is not the brightest star in Orion; Rigel is. Betelgeuse varies between magnitudes +0.3 and +1.2, while Rigel is rated magnitude +0.1. Perhaps Bayer was victim to what's called the *Purkinje Effect*. This optical illusion causes red stars to grow in brightness the longer you stare at them.

Orion's arm is usually shown on star maps as raised high above Betelgeuse and holding a club to do battle with Taurus, the Bull. Let's trace his arm northward from Betelgeuse, stopping at a few interesting spots along the way. First, some 7 degrees north of Betelgeuse, we come to open cluster **NGC 2169**. Look for it to the southeast of the midpoint between Nu Orionis and Xi Orionis. This small, bright open cluster is made up of about 30 stars ranging from magnitudes 8 to 10. Binoculars reveal the four brightest cluster members buried in a small, misty glow. In addition, there are two small asterisms just to the southeast of NGC 2169 that make a fun addition to the scene.

Another open cluster, **NGC 2194**, is plotted to the southeast of NGC 2169 on the chart above, but poses a much tougher challenge. The best I can muster in my 10x50 binoculars is a faint suggestion of its existence, and only then under clear, dark skies. How about you?

As you trace out Orion's raised right arm northward, you'll pass many neat little patterns of stars dotting the way. Although they are not true star clusters, each certainly adds to the beauty of this rich region of the winter sky.

Finally, pause at the top of Orion's arm, marked by Chi-1 and Chi-2 Orionis. Scan just 2 degrees to their east and you will find **NGC 2175**, an often-ignored open cluster. I bumped into it again not long ago through my 10x50s and saw it as a small tuft of celestial fuzz. An arrow-shaped asterism to its southeast points the way.



*Left: NGC 2169
and surroundings
as seen through
the author's 10x50
binoculars.*

North is up.

Two large, but little known open clusters from the Collinder catalog also reside in this part of Orion. First, there is **Collinder 69**, which includes Lambda Orionis, the star at the top of the Hunter's tiny, triangular head, as well as with several dozen fainter suns within about 1 degree. Most binoculars reveal between 15 and 20 stars ranging in brightness from 5th to 9th magnitude. Studies also show that, like Betelgeuse, Collinder 69 is probably no more than 10 million years old.

The second Collinder cluster, **Collinder 65**, is north of Orion's head and spills into adjacent Taurus. By adding a few non-cluster stars to the east and north, I imagine this cluster as a spear that Orion is about to heave at the Bull. "Orion's Spear" measures about 8° tip to tip, which makes it perfect for 7x and 8x binoculars.

To find our final target this month, you'll need to head east from Betelgeuse and cross the border into Monoceros. A unicorn by design, Monoceros contains several noteworthy open clusters for binoculars. We will visit several next month, but for now, we pause at **NGC 2251**, 10 degrees due east of Betelgeuse. Listed among the targets that make up the Astronomical League Deep-Sky Binocular Club's observing list, NGC 2251 shows a tiny knot of unresolved starlight in my 10x50s, nestled in a grand field of view that includes NGC 2244 about half a field of view to the south. Revisit my February 2010 e-column for more information on that pretty open cluster as well as the huge wreath of nebulosity -- the Rosette Nebula -- that surrounds it.

NGC 2244 is just one of the many other objects awaiting you in this month's Binocular Universe. Here is a list of many more.

Object	Con	Type	R.A. (2000)	Dec	Mag	Size/Sep/ Period	Notes
2129	Gem	OC	6 1	+23 18	6.7	7'	
2158	Gem	OC	6 7.5	+24 6	8.6	5'	*TUB page 155* SW of M35
BU	Gem	Vr	6 12.3	+22 54	5.7-7.5		*TUB page 155* Irregular
Eta	Gem	Vr	6 14.9	+22 30	3.2-3.9	232.9 days	Semi-Regular
Cr 89	Gem	OC	6 18	+23 38	5.7p	35'	*TUB page 155*
Nu	Gem	**	6 29	+20 13	4.2,8.7	113"	329°(1924);5103
Cr 92	Mon	OC	6 22.9	+5 7	8.6p	11'	
T	Mon	Vr	6 25.2	+7 5	5.6-6.6	27.021 days	Cepheid
2236	Mon	OC	6 29.7	+6 50	8.5	7'	
Cr 95	Mon	OC	6 30.5	+9 56		19'	
Cr 97	Mon	OC	6 31.3	+5 55	5.4	21'	*TUB page 178* Includes variable star AX M
2237	Mon	DN	6 32.3	+5 3		80'x60'	*TUB page 179-180* Rosette Nebula
2244	Mon	OC	6 32.4	+4 52	4.8	24'	*TUB page 179-180* Rosette Nebula cluster
2251	Mon	OC	6 34.7	+8 22	7.3	10'	
2252	Mon	OC	6 35	+5 23	8.op	20'	
Cr 106	Mon	OC	6 37.1	+5 57	4.6p	45'	*TUB page 180*
Cr 107	Mon	OC	6 37.7	+4 44	5.1	35'	*TUB page 180*
Cr 111	Mon	OC	6 38.7	+6 54	7.0p	3'	
2261	Mon	DN	6 39.2	+8 44	10.0	2'	*TUB page 180* Hubble's Variable Nebula
2264	Mon	OC	6 41.1	+9 53	3.9	20'	*TUB page 180* Christmas Tree cluster
Cr 65	Ori	OC	5 26	+16 0	3.0p	220'	*TUB page 191*
B30-2	Ori	Dk	5 29.8	+12 32		80'x55'	3° NW of Lambda
Cr 69	Ori	OC	5 35.1	+9 56	2.8p	65'	*TUB page 192* Lambda Ori
B35	Ori	Dk	5 45.5	+9 3		20'x10'	
B36	Ori	Dk	5 49.7	+7 31		120'	
Alpha	Ori	Vr	5 55.2	+7 24	0.4-1.3	2110 days	*TUB page 194* Semi-Regular Betelgeuse
U	Ori	Vr	5 55.8	+20 10	4.8-12.6	372.40 days	Long Period Variable
2169	Ori	OC	6 8.4	+13 57	5.9	7'	*TUB page 194*
2175	Ori	OC	6 9.8	+20 19	6.7	18'	
2194	Ori	OC	6 13.8	+12 48	8.5	10'	
75	Ori	**	6 17.1	+9 57	5.4,8.5	117"	159°;4890
M1	Tau	DN	5 34.5	+22 1	8.2	6'x4'	*TUB page 238-239* NGC 1952; Crab nebula (
OSS 67	Tau	**	5 48.4	+20 52	6.1,8.6	76"	161°(1933);4392

I hope that 2013 bring us all many clear nights to get out and enjoy our universe. And of course, in the new year as in the past, remember that for stargazing, two eyes are better than one.



About the Author:

Phil Harrington has written 9 books for amateur astronomers, including his latest, *Cosmic Challenge*. Be sure to visit his web site at www.philharrington.net for more information.

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