Binocular Universe:

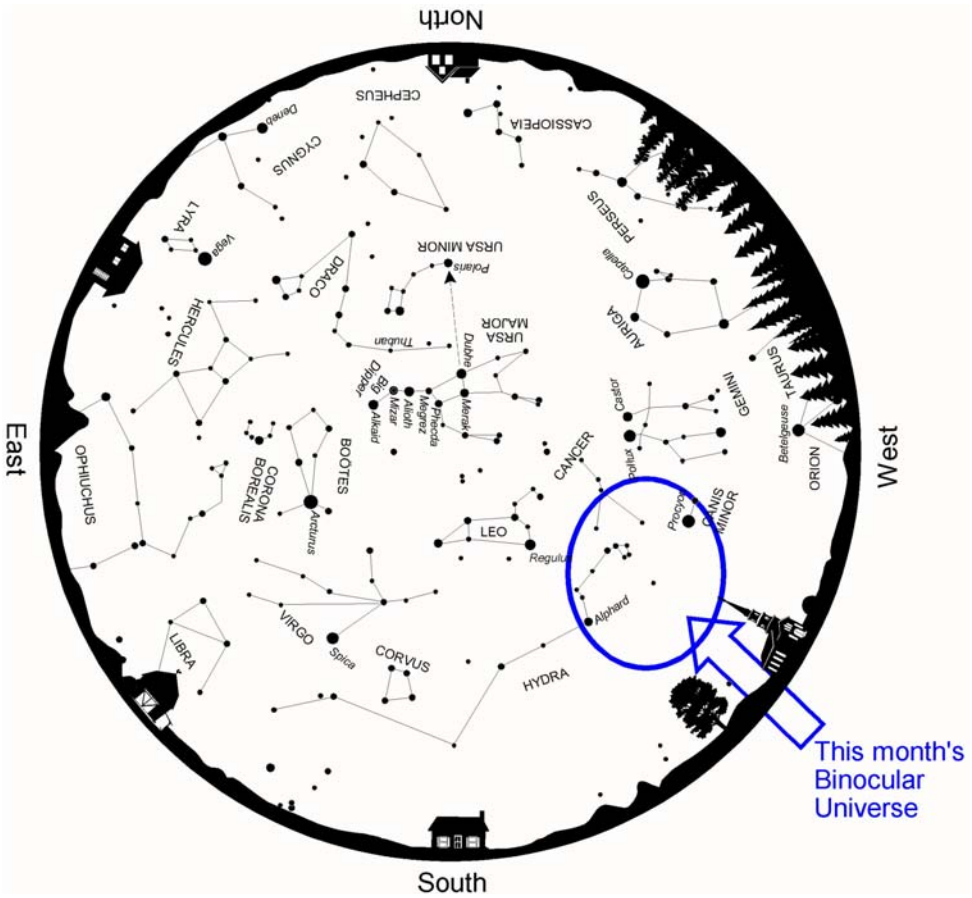
Hydra's Arrow-Head

April 2010

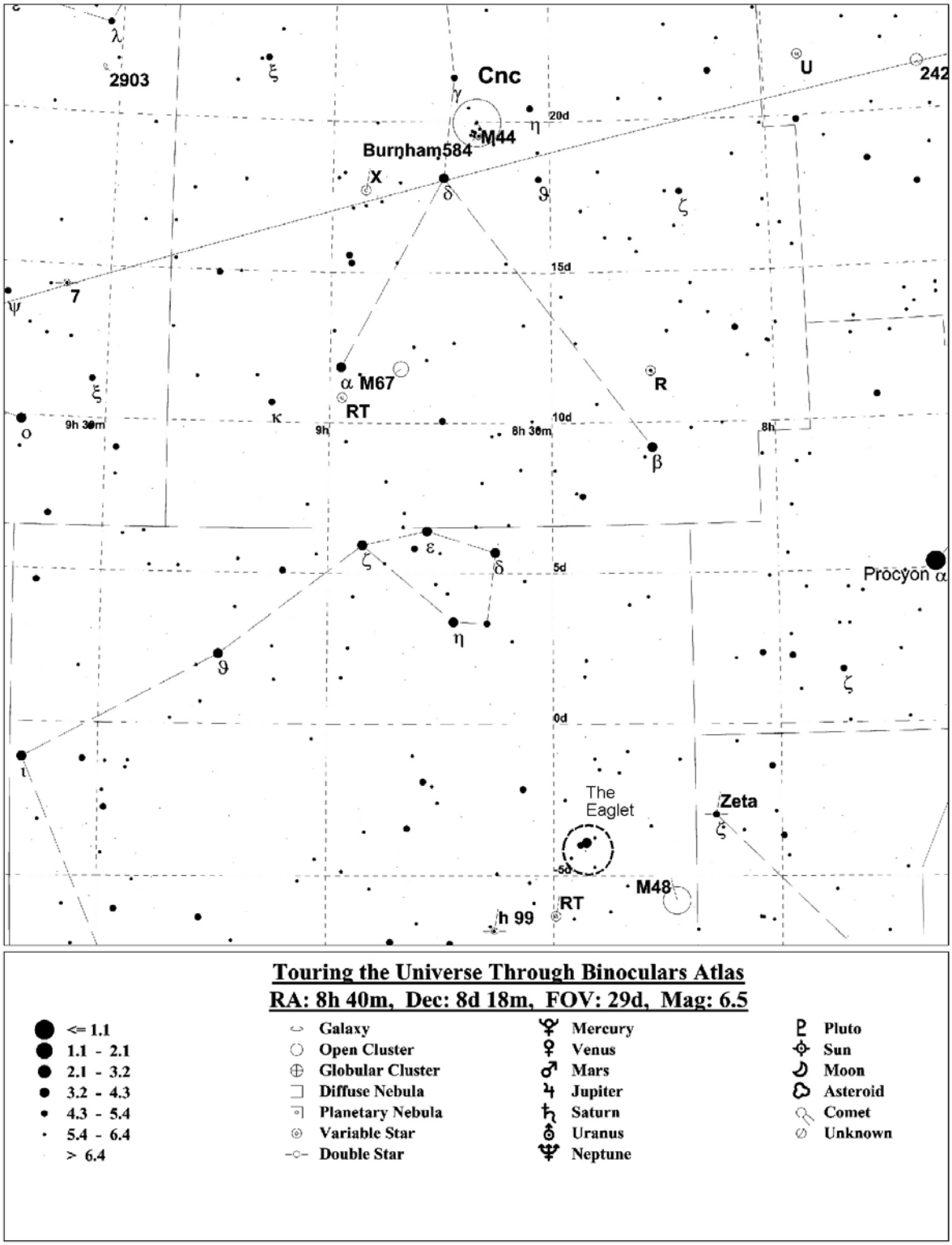
Phil Harrington

The sky's longest constellation, Hydra, slithers along the southern horizon every spring, spanning the full width of the seasonal sky. Westernmost Hydra, lying just east of Canis Minor and winter's Milky Way, consists of a four-star trapezoid marking one of the serpent's seven heads. The Serpent's long, slithering body winds its way across the southern spring sky to end near Libra, Scorpius and the gateway to the summer Milky Way.

While none of its stars shine brighter than 3rd magnitude, the distinctive shape of Hydra's head help them to stand out in an area otherwise void of naked-eye stars. All fit neatly into the field of 10x50 binoculars.



Above: Spring star map from Star Watch by Phil Harrington



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

We can use Hydra's head like an arrow to find two pretty spring open star clusters. First, draw a line from Epsilon Hydrae through Sigma Hydrae as shown on the finder chart here, and continue on 11°, or about two binocular fields, toward the southwest. Keep an eye out for the 4th-magnitude star SAO 135896 surrounded by a small triangle of fainter suns. I call that asterism **the Eaglet** for its resemblance to Aquila the Eagle, with SAO 135896 starring in the role of Altair.

The Eaglet flies a little to the east of **M48**. If you center on it, M48 should just squeeze into the southwestern edge of your binoculars' field of view.

M48 is a very pretty open star cluster through all binoculars. Look for a dim haze of unresolved starlight almost twice as large as the full Moon. The brightest star in M48 shines at 8th magnitude, and so should be visible through 50-mm binoculars. From dark skies, you might also glimpse three stars in a triangular pattern at the cluster's center. The remaining cluster stars blend into a homogeneous glow that stands out well against the surrounding sky.

Left: M48 as seen through the author's 10x50 binoculars. Note the tight triangle of stars in the cluster's center.

North is up.

High-power giant binoculars resolve M48 into a bright, concentrated collection of more than 50 stars, many of which appear set in lines and arcs. A tight grouping of eight suns resembling a capital "A" highlights the center of the cluster, while outliers seem to give

the cluster an overall triangular shape, looking something like an arrowhead that is aimed toward the east.

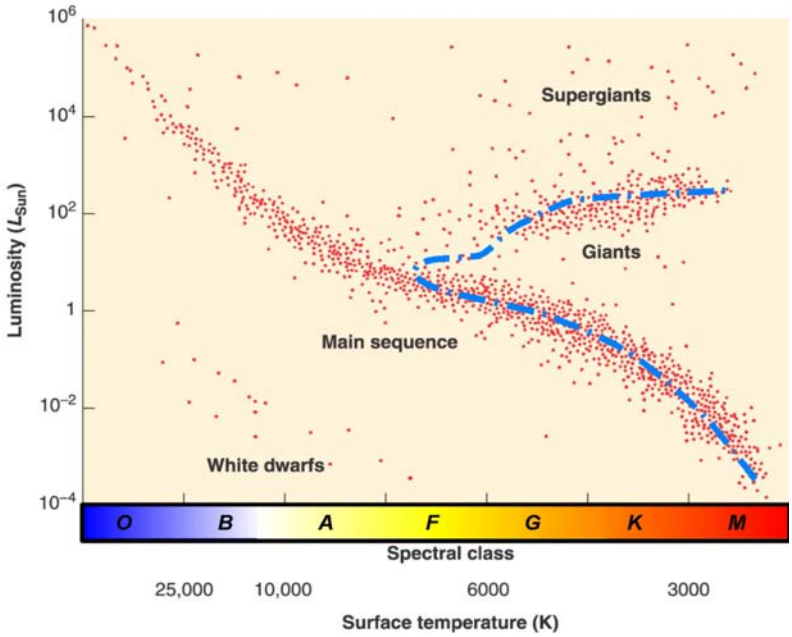
When Charles Messier discovered M48 in 1771, he mistakenly noted its position as 4° farther north than it actually is. This bungle caused M48 to be listed as "lost" for nearly two centuries. While examining Messier's records, T.F. Morris of the Royal Astronomical Society of Canada found that open cluster NGC 2548 agreed with Messier's description of M48. As a result of his research, both clusters are regarded as one and the same.

M48 lies about 1,500 light-years from us, with its 80 stars spread across 23 light years. Most of the stars are type-B blue giants, although three yellow giants have also been found. Their average age is believed to be about 300 million years

Head back to Hydra's head, and this time, extend a line from Eta Hydrae northward through Epsilon Hydrae, and beyond for 5°. You'll cross into Cancer the Crab and bump right into open cluster **M67**. Look for a misty glow set between Acubens (Alpha Cancri) and two fainter stars to its west.

Since the stars in M67 are 10th magnitude and fainter, they are too faint to resolve through most handheld binoculars. A few faint points, however, may be seen using averted vision through giant binoculars braced on a tripod. All told, M67 contains 500 stars scattered across half a degree.

M67 is often mentioned as one of the oldest star clusters known, estimated to be between 3 and 4 billion years old. How do astronomers know that? It turns out that many of the stars in the cluster are red giants. Stars along the main sequence of the Hertzsprung-Russell (H-R) Diagram evolve into red giants only after they have used up all of the fusible hydrogen in their cores. Depending on the star's mass, this can take millions or billions of years. The greater a star's mass, the faster it evolves. By knowing the masses of the red giants in M67, the stars' ages -- and by extension, the age of the cluster itself -- can be calculated.



Left: The H-R Diagram of M67. Notice how the stars turn off the main sequence and veer up and to the right. Depending on where that turn-off point lies along the main sequence, astronomers can determine the age of the stars in a cluster.

While we are here, it would be a shame to miss out on the Beehive Cluster, **M44**. Look for it 8° north-northwest of M67, within the Crab's trapezoidal body. Based on similar studies, M44 is thought to be about 400 million years old.

M44 comes alive through just about any pair of binoculars, no matter how large or small, expensive or not. Thanks to its empty surroundings, the group really dazzles the eye. Up to 30 stars between 7th and 9th magnitude are seen scattered across the cluster through 7x binoculars, with some of the points set in interesting pairs or patterns. Nine of the brightest near the center of the cluster form a distinctive V asterism that is sometimes called the Heart of the Crab. The Heart points toward the southwest and always attracts attention.

These and other targets inside this month's binocular universe are included in the list below. See how many you can find tonight!

Object	Con	Type	R.A. (2000)	Dec	Mag	Size/Sep/ Period	Notes
R	Cnc	Vr	8 16.6	+11 44	6.1-11.8	361.60 days	*TUB page 100-101* Long Period Variable
Burnham584	Cnc	**	8 39.9	+19 33	6.9,7.2	45",93"	*TUB page 101* 156°,241°(1952);6915;in M44
M44	Cnc	OC	8 40.1	+19 59	3.1	95'	*TUB page 101* NGC 2632, Beehive or Praese
M67	Cnc	OC	8 50.4	+11 49	6.9	30'	*TUB page 101* NGC 2682
X	Cnc	Vr	8 55.4	+17 44	5.6-7.5	195 days	Semi-Regular
RT	Cnc	Vr	8 58.3	+10 51	7.1-8.6	60 days	Semi-Regular
2420	Gem	OC	7 38.5	+21 34	8.3	10'	
U	Gem	Vr	7 55.1	+22 0	8.2-14.9	103 days?	*TUB page 156* Irregular; U Gem prototype
M48	Hya	OC	8 13.8	-5 48	5.8	55'	*TUB page 160-161* NGC 2548
RT	Hya	Vr	8 29.7	-6 19	7.0-11.0	253 days	Semi-Regular
h 99	Hya	**	8 37.8	-6 48	6.8,9.1	61"	202°(1918);6900
2903	Leo	Gx	9 32.2	+21 30	9.0	13'x7'	*TUB page 164-165* Sb+
7	Leo	**	9 35.9	+14 23	6.2,10.0	41"	80°(1946);7448
Zeta	Mon	**	8 8.6	-2 59	4.3,7.8	67"	245°(1936);6617

Have a question, a comment, or a suggestion for future columns? I'd love to hear it. Post your observations in this column's discussion forum or drop me a line at phil@philharrington.net.

As you slog through April's showers, try to remember that they bring May flowers, as well as more of the springtime binocular universe. So, until we meet again next month, don't forget that two eyes are better than one.

About the Author:

Phil Harrington is the author of Touring the Universe through Binoculars. Visit his web site at www.philharrington.net for a preview of his next book, Cosmic Challenge.