

# Binocular Universe:

## You're My Hero!

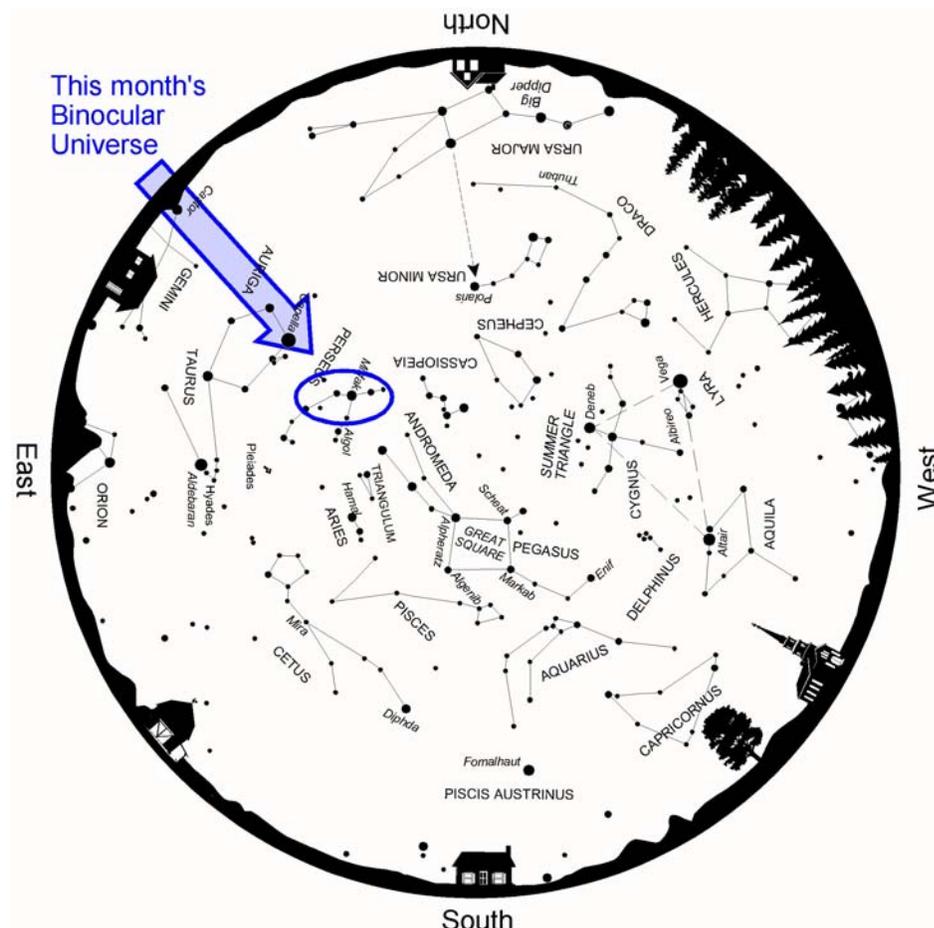
December 2010

[Phil Harrington](#)

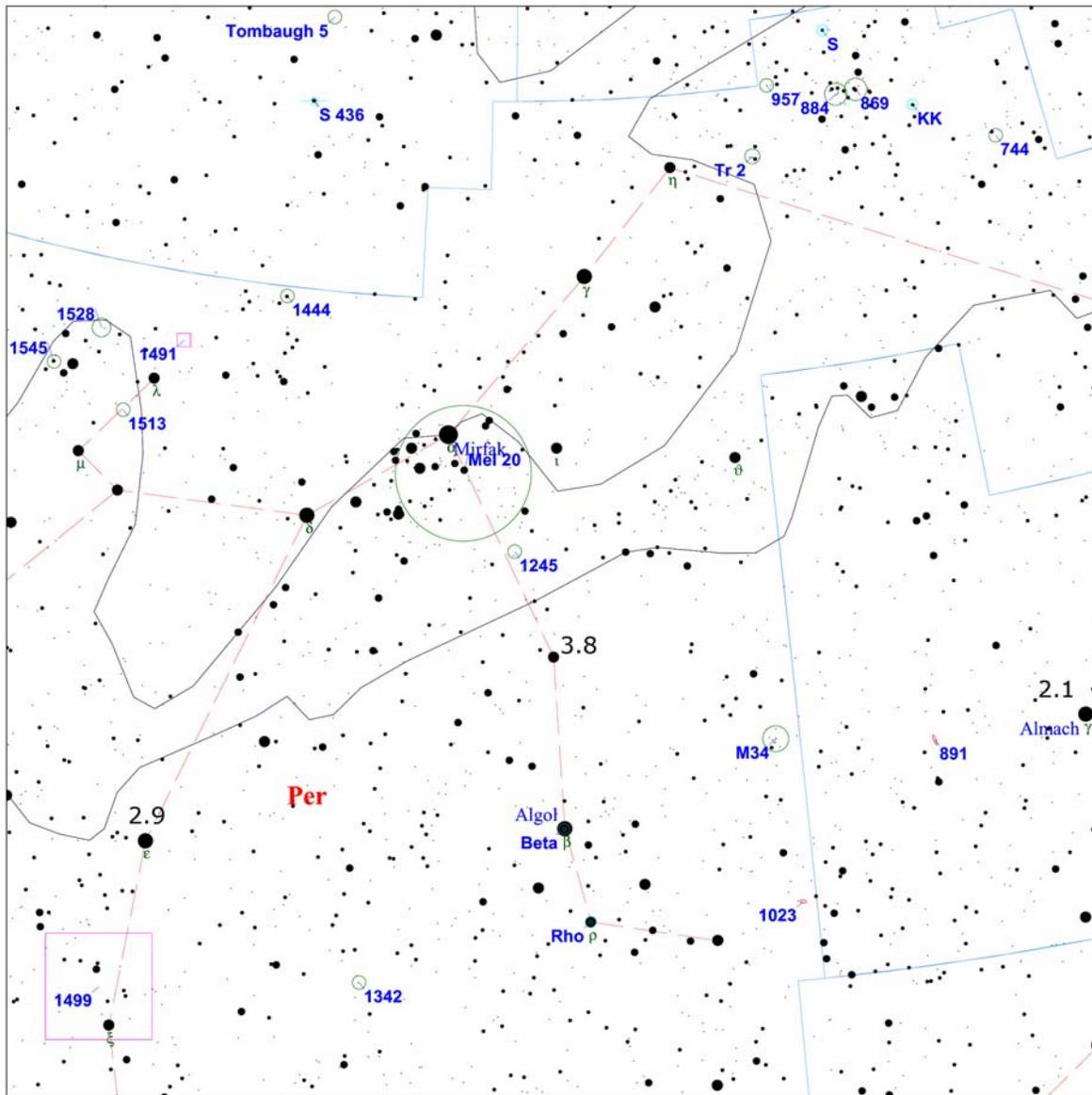


Don't you just love a happy ending? I know I do. Picture this. Princess Andromeda, a helpless damsel in distress, chained to a rock as a ferocious sea monster loomed nearby. Just when all appeared lost, our hero -- Perseus! -- plunges out of the sky, kills the monster, and sweeps up our maiden in his arms. Together, they fly off into the sunset on his winged horse to live happily ever after.

Such is the stuff of myths and legends. That story, the legend of Perseus and Andromeda, was recounted in last month's column when we visited some binocular targets within the constellation Cassiopeia. In mythology, Queen Cassiopeia was Andromeda's mother, and the cause for her peril in the first place.



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



**Touring the Universe Through Binoculars Atlas**  
**RA: 3h 9m, Dec: 47d 15m, 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](http://www.philharrington.net/tuba.htm)

This month, we return to the scene of the rescue, to our hero, Perseus. He stands in our sky to the east of Cassiopeia and Andromeda, should the Queen's bragging get her daughter into hot water again.

The constellation's brightest star, **Mirfak** (Alpha [ $\alpha$ ] Persei), lies about two-thirds of the way along a line that stretches from Pegasus to the bright star Capella in Auriga. Shining at magnitude +1.8, Mirfak is classified as a class F5 white supergiant. It radiates some 5,000 times the energy of our Sun and has a diameter 62 times larger. Measurements show it to be about 590 light years away.

Examining Mirfak through binoculars shows that it is surrounded by dozens of fainter stars scattered in small clumps and knots. While most of the stars appear white or blue-white, a few might show subtle hints of yellow or orange. For instance, the star Sigma ( $\sigma$ ) Persei, one of three suns forming a small triangle south of Mirfak, shines with a distinctly orangish hue.

Together, the stars gathered into this football-shaped area form the **Alpha Persei Association**. A stellar association contains mostly blue-white and white (spectral types O, B, and A) stars, like most open star clusters. Typically, however, the stars in an association are more loosely gathered than those in open clusters. In the case of the Alpha Persei group, some 50 suns are bound by their mutual, though weak gravitational grip. All are about the same distance away as Mirfak, having formed from a common cloud of interstellar gas and dust an estimated 51 million years ago. Eventually, they will scatter as their gravitational embrace continues to weaken.

The Alpha Persei Association is also known as the **Per OB3 Association** and **Melotte 20**. The latter refers to its listing in Philibert Jacques Melotte's catalog of 245 open star clusters. The Melotte catalog is a great resource for binocularists, since it contains many targets that are too large to be easily detectable in the narrow fields of telescopes.

The Alpha Persei Association is a beautiful sight through even with the smallest pocket binoculars, as is our next target, open cluster **M34**. M34 is located roughly midway between Algol (Beta [ $\beta$ ] Persei) and Almach (Gamma [ $\gamma$ ] Andromedae). Algol and M34 are separated by  $5^\circ$ , so depending on the span of your binocular's field, both may just squeeze into the same view.

Through most binoculars, M34 looks like a hazy patch of light about as large as the Full Moon. Look for the brightest of its hundred or so stars twinkling in the soft glow of fainter, unresolved suns. If distance estimates of 1,400 light years to M34 are correct, then the cluster spans about 14 light years edge to edge.

Interestingly, M34's discovery predates Messier's first encounter by more than a century. Giovanni Batista Hodierna, an Italian astronomer in the court of the Duke of Montechiaro, was the first to spot it, probably before 1654. Messier independently rediscovered it in 1764.



*The Alpha Persei Association (Melotte 20) as sketched through the author's vintage extra-wide field 7x50 binoculars. North is up.*

While we are in the area, be sure to pay a call on **Algol**, the famous "Demon Star." Algol is a fun variable star to follow through binoculars, but in the past, it was viewed with fear and dread. In the Iliad, Homer described Algol as "a ghastly sight, deformed and dreadful, and a sight of woe."

Had Homer looked more carefully, he might have noticed an even more dreadful sight – that Algol was actually winking at him. That's because every 2 days, 20 hours, 49 minutes, the star's brightness drops from magnitude 2.1 to magnitude 3.4.

Algol is not actually winking at us, of course. These apparent fluctuations are the result of an unseen companion star passing in front of the binary system's primary star. Each eclipse lasts about 10 hours. As the companion moves off the primary, Algol returns to peak brightness. A second, minor dip in brightness occurs as the companion passes behind the primary. The apparent brightness of Algol keeps it well within naked eye and binocular range across its entire cycle, making it an ideal star for fledgling variable star observers to follow.

To track Algol, compare it periodically with stars of known brightness in its immediate surroundings. Use Gamma ( $\gamma$ ) Andromedae to the west of Algol at magnitude 2.1, Epsilon ( $\epsilon$ ) Persei to its east at magnitude 2.9, and Kappa ( $\kappa$ ) Persei to its north at magnitude 3.8. All are labeled on the chart above, while the table here lists the dates this month when Algol will be at minimum brightness.

Algol Minima: December 2010	
Dec 3	07:35 UT
Dec 6	04:24 UT
Dec 9	01:13 UT
Dec 11	22:02 UT
Dec 14	18:52 UT
Dec 17	15:41 UT
Dec 20	12:30 UT
Dec 23	09:19 UT
Dec 26	06:08 UT
Dec 29	02:58 UT
Dec 31	23:47 UT

Finally, let's close this month with a pair of open clusters that are more challenging than the objects discussed above. Both lie east of the Alpha Persei Association, near a double-triangle asterism formed by Lambda, Mu, 48, and 53 Persei.

The easier of the pair to spot is **NGC 1528**. Under dark skies, my 10x50 binoculars show a perfectly round smudge of distant starlight just beyond a tiny Y-shaped asterism of stars.

**NGC 1545** is a tough catch, even through large binoculars. All I can make out is a very subtle hint of its existence around the faint stars SAO 24556 and SAO 24554. My 25x100 giant binoculars add only a few additional dim points within.

For readers who would like to delve deeper still, here is a list of some additional binocular targets plotted on this month's finder chart. Try your luck with each and report your results in this column's discussion forum.

Object	Con	Type	R.A. (2000)	Dec	Mag	Size/Sep/ Period	Notes
1664	Aur	OC	4 51.1	+43 42	7.5	18'	
Tombaugh 5	Cam	OC	3 47.8	+59 3	8.4	17'	
S 436	Cam	**	3 49.3	+57 7	6.5, 7.3	58"	75° (1975)
1245	Per	OC	3 14.7	+47 15	8.4	10'	
Mel 20	Per	OC	3 22	+49 0	1.2	185'	*TUB page 201-202* Alpha Per Cluster
1444	Per	OC	3 49.4	+52 40	6.6	4'	
1491	Per	DN	4 3.4	+51 19		3'	
1513	Per	OC	4 10	+49 31	8.4	9'	
1528	Per	OC	4 15.4	+51 14	6.4	25'	*TUB page 203*
1545	Per	OC	4 20.9	+50 15	6.2	18'	*TUB page 203*
1582	Per	OC	4 32	+43 51	7 p	37'	
57	Per	**	4 33.4	+43 4	6.1, 6.8	116"	198° (1913)

Next month, we will kick off 2011 with one of my favorite winter targets, the Hyades. Until then, let me wish you and yours a very merry Christmas, happy Hanukah, happy holidays, and a cloud-free new year. And if you have any

comments or suggestions for future columns, please e-mail me at [phil@philharrington.net](mailto:phil@philharrington.net).

As always, remember that, when it comes to stargazing, two eyes are better than one!

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**About the Author:**

Phil Harrington is the author of eight books on astronomy, including Touring the Universe through Binoculars. Visit his web site at [www.philharrington.net](http://www.philharrington.net) for a preview of his new book, Cosmic Challenge, just released from Cambridge University Press.

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