

# Reflector

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**Big and Bright at ALCon 2014**

**Distant Echo—Globular Clusters**

**ALCon 2015—Las Cruces, New Mexico**

**Outreach Idea: A Telescope Clinic**

The constellation Gemini depicts the twins Castor and Pollux from Greek and Roman mythology. Two stars with those names form a prominent pair 4.5 degrees apart on the outskirts of the winter Milky Way. Like their namesakes, the stars Castor and Pollux look like twins, but they are not identical. Pollux, the southern star of the pair, is slightly brighter and more yellow than the white star Castor. Both are bright enough to be seen in metropolitan areas even with significant light pollution.

Twenty degrees west-southwest of Castor, near the galactic equator, lies another set of fraternal twins in the constellation Gemini: M35 and NGC 2158. This pair of star

clusters can be viewed in a single telescopic field of view, although unlike the Dioscuri pair of stars, a dark observing site is recommended.

I took the accompanying image of M35 and NGC 2158 with a 4-inch f/6.3 apochromatic refractor using an SBIG ST-2000XCM CCD camera. The exposure was 30 minutes. North is up and west is to the right. The field of view is centered on M35, and NGC 2158 is in the lower right hand corner.

Philippe Loys de Chéseaux is usually given credit for discovering M35 in the year 1745. Charles Messier knew of its existence in 1750 but he did not add it to his catalog until 1764. Twenty years later, William Herschel discovered NGC 2158.

With an integrated magnitude near 5.0, M35 can be found 2.5 degrees northwest of the star Eta Geminorum. From an

# DEEP-SKY OBJECTS

## FRATERNAL TWINS IN GEMINI

By Dr. James R. Dire, Kauai Educational Association for Science & Astronomy



extremely dark observing site, M35 appears as a fuzzy glow to unaided eyes. Binoculars begin to bring out the true stellar nature of the cluster. However, the cluster is best appreciated with a 6- or 8-inch telescope. The apparent diameter of the cluster is 30 arcminutes, similar to the diameter of the Moon. The edge of the cluster is irregular and blends in with background and foreground stars.

M35 contains several bright yellow and orange giant stars. The brightest star in the cluster is the G0 star SAO 78038, shining at magnitude 7.4. SAO 78038 is a binary star with components of magnitudes 7.5 and 8.7 separated by 31 arcseconds. This pair is easily split using a 3-inch refractor. There is a blue-white star on the southeast edge of the cluster of similar brightness. It is not a true member of the

cluster, however, but a foreground star. The second brightest actual member of the cluster is an orange star on M35's north side shining at magnitude 8.5. The cluster contains many faint red and blue stars, too. Overall, M35 has 120 stars brighter than 13th magnitude and may contain 500 stars in all. The cluster is nearly 3000 light-years away.

Just under half a degree southwest of M35 lies the tiny

star cluster NGC 2158. Wide-field telescope-eyepiece combinations display both star clusters simultaneously, although in small telescopes the 4-arcminute, 8.6-magnitude cluster may appear only as faint nebulosity. At higher magnifications (greater than

100x) with an 8-inch telescope, many stars can be resolved. Most of the brighter stars are 13th magnitude red giants, but there is a magnitude 10.5 white star on the southeast edge of the cluster. The high concentration of stars in NGC 2158's center gives it the appearance of a small globular cluster, but it is not one.

NGC 2158 is considered an intermediate age galactic star cluster because

the the most massive star still on the main sequence is spectral class F0. Estimates place its age at two billion years. In comparison, M35 is thought to be merely 100 million years old and it contains main sequence stars in all spectral classes. NGC 2158 lies 16,000 light-years away, much farther than M35. Were it the same distance as M35, the cluster would be much more impressive than its line-of-sight fraternal twin. ☼

### Call for League Officer Nominations

The two-year term of the office of secretary and the three-year term of the office of treasurer end on August 31, 2015. If you are interested in using your talents to serve in one of these important positions, we would like to hear from you. Please volunteer!

For specific information regarding the duties and responsibilities of these two offices, please refer to the League's bylaws, which can be accessed on the League website at [www.astroleague.org](http://www.astroleague.org).

Candidates should send background statements explaining why they are interested and a photo of themselves for publication in the *Reflector* to Nominating Committee Chair Bill Bogardus at [vicepresident@astroleague.org](mailto:vicepresident@astroleague.org). Please limit all statements to approximately 250 words. All nomination materials must be submitted by March 15, 2015.