



Figure 1 A wide-field (4 arcmin) 2MASS image of the target field. Some candidate guide stars are circled, and their coordinates are given in the table below.

The finding chart shows the location of six potential guide stars as a range of separations from the cluster center. These are all M supergiants in the cluster and are the brightest stars which appear to be isolated in the 2MASS images. The stars are all of similar brightness ( $K = 9-9.5$ ), which should translate to  $R \sim 12$ . That's a little faint for NGS purposes, but unfortunately all of the closer globular clusters (where giants would be closer to  $R \sim 10$ ) fall outside the RA or DEC restrictions.

If you want a very dense field to calculate astrometry, I suggest using the star closest to the core (number 1) and imaging the center of the core. This is the region of the cluster which was imaged with the Planetary Camera of WFPC2. If you're looking for a less dense field where you can accurately measure the strehl as a function of position, I recommend the fields centered on 1, 2, or 33. If those are still too dense, 4-6 are located at progressively larger separations where the source density should be lower.

Table 1. Potential Guide Stars in M15

Number	RA	DEC	$K$	$R_{cluster}$ (arcsec)
1	21 29 57.57	12 09 43.9	9.27	20.5
2	21 29 55.79	12 10 27.0	9.52	35.2
3	21 29 58.57	12 09 21.4	9.57	39.3
4	21 29 59.32	12 09 11.6	9.61	50.9
5	21 30 00.91	12 08 57.1	9.61	73.5
6	21 30 02.74	12 10 43.9	9.73	77.2

Since the brightest stars in the field are  $K \sim 9$ , you should be able to observe with the minimum exposure time on PHARO (1.4s) without much saturation. Total exposure times will probably depend on how many well-sampled sources you want in the images. The minimum exposure time should also be suitable for observations in J and H if you want to characterize the AO performance in these filters as well.