

# THE STRUCTURE OF $\eta$ AND $\chi$ PERSEI

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Well known methods for analyzing stellar distributions have been refined and new methods developed. Their application to  $\eta$  and  $\chi$  Persei is demonstrated.

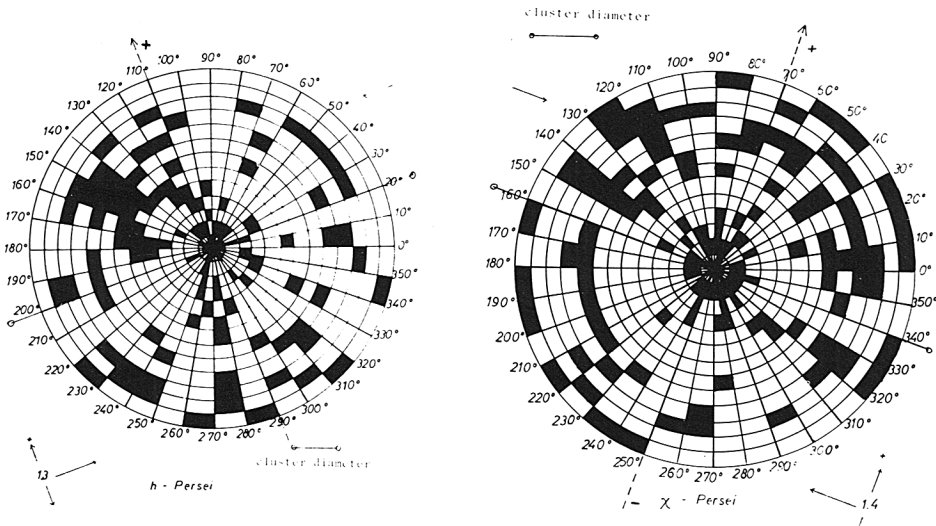


Fig. 1 and 2; The clusters were covered with a net of 12 rings concentric with the cluster centers. The rings were divided up into 36 10-degree sectors each. For each bin the stellar density was determined and the bins with the highest density in each ring were marked. Examination of their position shows an asymmetry with respect to the 20 - 200 degree line (for  $\eta$  Per) and the 160 - 340 degree line (for  $\chi$  Per): in  $\eta$ , high densities occur 1.3 times more often towards 110 degrees, in  $\chi$  they occur 1.4 times more often towards 70 degrees position angle.

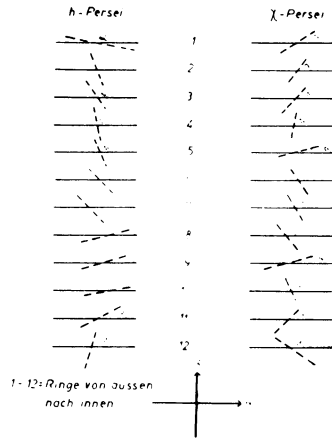


Fig. 3: The mass-direction diagram (ten Bruggencate, 1927) was constructed for each ring in the two clusters. These diagrams are generally of elliptic shape with the major axis representing the direction of the largest densities. Plotting the position angle of the major axis for each ring, we find a remarkable coincidence for the outer rings (1 to 5): the position angle is  $\alpha > 90^\circ$  for h Per and  $\alpha < 90^\circ$  for  $\chi$  Per. This systematic correlation disappears towards the center of the clusters (rings 6 to 12).

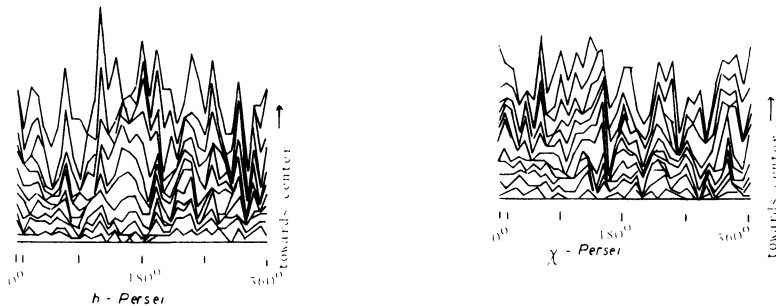


Fig. 4 and 5: These are plots of the density as a function of position angle for each ring in both clusters. We note that from bottom to top (=outside towards center of the clusters) each curve contains all curves below, i.e. each curve is the sum of all preceding curves. The plots also demonstrate the growing of the density towards the cluster center. The strongest growth occurs at  $110^\circ$  for h and at  $70^\circ$  for  $\chi$ , in exact coincidence with Figs. 1 and 2.

From the above indications we conclude an apparent inclination of the density distributions of h and  $\chi$  Persei towards each other.

#### REFERENCE:

ten Bruggencate, P.: 1927, Sternhaufen, Berlin, p.68