Dieter, Nannielou H. *Neutral hydrogen in OB associations.*

Analysis of the line profiles of the neutral hydrogen survey of the galactic plane published by Muller and Westerhout has shown many cases in which neutral hydrogen appears within OB associations. Intensity contour diagrams of regions including such associations have been constructed from the line profiles for different velocities. In Morgan's unpublished catalogue of OB associations 31 are listed which occur within the limits of the Leiden survey, and for 25 of these some measure of the radial velocity is available from optical observations. For 20 of these associations a well-defined maximum in the equal-intensity contour diagrams occurs at the velocity of the association and does not occur at other similar velocities. For the remaining six associations a maximum occurs at a particular velocity, but no identification of the gas with the association can be made without stellar radial velocity measurements.

The distance of a hydrogen cloud may be estimated from the distance of the association and from its velocity and a model of galactic rotation. Comparison of the distances from the two methods shows many large discrepancies.

The contour diagrams show that the maximum in the equal-intensity contours changes its longitude continuously in one direction as the velocity changes. In each of the twelve cases in which it is possible to follow the maximum through such a progression this direction is consistent with the effect of the shearing action of galactic rotation.

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Drake, F. D. *A high-resolution radio study of the galactic center.*

A radio map covering five square degrees in the region of the galactic center has been made, using the 85-foot reflector of the National Radio Astronomy Observatory. A travelling-wave tube receiver operating at 8000 Mc/s was used, and the antenna beamwidth was about 7 minutes of arc. The map shows regions of radio emission apparently connected with the emission nebulosities observed optically in the vicinity of the galactic center. It is evident that these H_{II} regions contribute only a very small amount of radio emission to the Sgr A source, and are not

a part of the galactic nucleus. The nucleus itself consists of two bright regions of emission situated about 10 and 19 parsecs from the galactic center, and lying in the galactic plane, and two more distant regions at a distance of about 90 parsecs from the galactic center, situated symmetrically about the center and lying in the galactic plane. From the symmetry in the outer sources, it is suggested that they actually represent the projection of a ring of emission surrounding the galactic center.

Using the above described structure of the nucleus, previous observations of this region are reanalyzed so as to give flux density values for the four major emitting regions. It is found that the center two sources have thermal spectra, while the outer two have nonthermal spectra with spectral index 0.7. The inner two sources are interpreted to be H_{II} regions. The brighter has a minimum emission measure of $5(10^6)$, a minimum electron density of 106 electrons/cm³, and a maximum mass of $5(10^4)$ solar masses. The fainter has a maximum emission measure of $2(10^5)$, a minimum electron density of 58 electrons/cm³, and a maximum mass of $6(10^4)$ solar masses.

Two models of the nucleus are proposed. In one, the "static nucleus" model, there are in the center about 10^9 solar masses of Population II stars in two small bodies similar to the nucleus of M31. The emitting gas is gas ejected from these stars, and the blue Population II stars excite the gas. A disk of neutral hydrogen rotates nearly as a solid body around this. In the second model, the "evolving nucleus" model, gas flows into the central parts of the nucleus, where massive young blue stars and the observed H_{II} regions are formed. About one solar mass of H_{II} per year flows out of the nucleus along a bar which terminates near the region of nonthermal emission. In both models the nonthermal emission is connected with magnetohydrodynamic effects associated with the galactic shear which commences in the region of the nonthermal emission. Both models are consistent with the present observations and the recent Leiden 21-cm observations of the region.

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Drake, F. D. and Hvatum, S. *Non-thermal microwave radiation from Jupiter.*

Observations of the radio flux from Jupiter have been made at 22-cm and 68-cm wave