Measurements of 15 other nebulae are in progress. The spectral resolution is 4 km s^{-1} with a total velocity range of about 125 km s^{-1}.

In all nebulae at least one absorption line was present, due to absorption in the interstellar medium in the local arm. For several of the nebulae a second absorption line was found, which from its velocity can be identified with the Perseus-arm or the Sagittarius-arm, indicating that these nebulae are either in or beyond the respective arm. Upper limits to the distance can be found by noting the absence of absorption from an arm further away. For example: the 21 cm line profile of NGC 2440 shows, besides local absorption, an absorption at a LSR-velocity $\approx$ +25 km/s. Assuming that this absorption is caused by galactic HI, this leads to a kinematic distance $\approx$ 2 kpc. The resultant distances are probably accurate to within 50%.

As a by-product of this work a limit can be placed on the amount of neutral hydrogen associated with the nebula as indicated by absorption at the nebular velocity. The value is often quite low. The results for NGC 7027 have recently been published (Pottasch et al., 1982).

Pottasch, S.R., Goss, W.M., Arnal, E.M., Gathier, R.: 1982, Astron. Astrophys. 106, 229.

OH/IR STARS NEAR THE GALACTIC CENTRE

H.J. Habing, F.M. Olnon
Sterrewacht, Huygens Laboratorium, Leiden

A. Winnberg, H.E. Matthews
Max-Planck-Institut für Radioastronomie, Bonn

B. Baud
Radio Astronomy, University of California, Berkeley

We have detected 34 OH/IR stars within 1 degree of the galactic centre by their OH emission line at 1612 MHz (18 cm) using the Effelsberg 100 m telescope and the Very Large Array. The spatial distribution and the distribution of the radial velocities show that practically all stars are within 150 pc from the Galactic centre, and that the number of foreground objects is very small. The projected distribution of the stars is similar to that of the surface brightness at 2.4 μm. Since the 2.4 μm radiation is supposed to be due to red giants, the OH/IR stars are probably members of the same population. The stars have considerable

https://doi.org/10.1017/S0074180900094432 Published online by Cambridge University Press

random velocities (velocity dispersion in one coordinate of 150 ± 50 km s^{-1}), but show general Galactic rotation. The high velocity dispersion is remarkable for objects of this population.

VELOCITY DISPERSION AND LUMINOSITY FUNCTION OF PLANETARY NEBULAE IN THE NUCLEAR BULGE OF M31

D.G. Lawrie
Ohio State University, USA

H.C. Ford
Space Telescope Science Institute

We used a sequence of velocity-modulated photographs to find and measure the radial velocities of faint planetary nebulae in the center of M31. The photographs were made with a Velocity Modulating Camera (VMC) which consists of a temperature-tuned 2.1 Å (FWHM) [O III] λ 5007 interference filter, a cooled, two-stage image intensifier, and a calibrating photomultiplier. The camera was mounted at the Cassegrain focus of the Shane 3 m telescope at Lick Observatory. We identified 19 new planetary nebulae, bringing the total number of known planetaries within 250 pc of M31's nucleus to 45. From the plate series, we derived radial velocities and relative brightnesses from 32 of the nebulae and placed radial velocity limits on the remaining nebulae in the field. By applying the method of maximum likelihood to the observed radial velocity distribution, we derive a mean heliocentric velocity of -309 (±25) km s^{-1} and a velocity dispersion of 155 (±22) km s^{-1} for the planetary nebulae.

The first three magnitudes of the planetary nebulae luminosity function, after correction for interstellar extinction in M31, is given by n(mag) = constant. We derive a planetary-to-luminosity ratio (PLR) of 69 ± 9 for the luminosity which corresponds to an integrated blue magnitude, m_B = 8.37. We combined the PLR with M31's integrated magnitude to estimate that there are 2800 ± 350 nebulae in the first three magnitudes of M31's luminosity function. By combining our observed luminosity distribution with Jacoby's (1980) Magellanic Cloud distribution, we estimate that M31 has 21,000 ± 2600 planetary nebulae within 8 magnitudes of the brightest nebulae.

https://doi.org/10.1017/S0074180900094432 Published online by Cambridge University Press