

DARK MATTER IN THE POLAR RING SPIRAL NGC 660**WIM VAN DRIEL***Nançay Radio Observatory**Observatory of Paris-Meudon, 92195 Meudon, France*

Polar ring galaxies, where rotation velocities can be measured in two orthogonal planes, are generally considered to be ideal objects for studies of the three-dimensional distribution of dark matter in galaxies.

In the unique, nearby, peculiar polar ring LINER galaxy NGC 660 both the gas-rich polar ring and the equatorial spiral disk were mapped in the $H\alpha$, H I, and CO(2-1)/(1-0) emission lines, as well as in the BVRIJHK bands.

NGC 660 is the only known polar ring galaxy with a gas-rich spiral, rather than a quiescent lenticular, equatorial disk, which allows the measurement of accurate emission-line rotation velocities in both the disk and the polar ring. The polar ring age, estimated from its stellar population, of a few billion years requires a stabilizing mechanism against differential precession. A mass model fit, based on surface photometry and rotation curves, shows that the polar ring is almost as massive as the disk and the dark halo component, indicating self-gravity of the ring as a likely stabilizing mechanism. The three-dimensional shape of the dark halo could not be restrained, however, since there is no overlap in radius between the rotation curves of the equatorial disk and the polar ring; a common, but hitherto unnoted, problem in polar ring galaxy studies.

References

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