ON THE NATURE OF OH/IR STARS

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ABSTRACT

OH/IR stars are the infrared counterparts of galactic OH maser sources which show a characteristic double-peaked emission-line profile. Their strong radio emission can be detected at large distances, making them excellent tracers of distribution and kinematics of evolved stars in the Milky Way. The OH maser profile is typical for line emission from an expanding circumstellar shell. The circumstellar shells of OH/IR stars absorb the optical emission of the central star nearly completely and reemit the energy in the infrared. Having luminosities ~ 10^5 $L_\odot$ and energy distributions peaking around 10μm, they may make a major contribution to the interstellar radiation field beyond 5μm. With mass loss rates of 10^{-5} to 10^{-4} $M_\odot$/yr they lose several solar masses in a few hundred thousand years. OH/IR stars are therefore important objects for recycling stellar matter into the interstellar medium.

Progress has been made in understanding the nature of OH/IR stars. They are Mira-like large-amplitude variables with periods up to 5 years long. It is proposed that they are stars of intermediate mass (2-10 $M_\odot$) on the asymptotic giant branch (AGB). They have not only larger masses than Mira variables proper, but also longer periods of pulsation and larger mass loss rates. As a result optically thick circumstellar dust shells are formed, which prevent the detection of these more massive Mira-like variables at optical wavelengths. Radial pulsation (Mira variability) is thus thought to occur for all intermediate-mass stars in the course of their evolution on the AGB. In view of their high mass-loss rates, these stars may be key objects in the study of the formation of planetary nebulae.

H. van Woerden et al. (eds.), The Milky Way Galaxy, 131.

Gösta Lyngå playing checkers at the conference dinner. To his left: Elaine Sadler and Claude Carignan; to his right: a guest, Mme. Carignan and Ken Freeman

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