# TWO-DIMENSIONAL HYDRODYNAMICAL MODELS OF PLANETARY NEBULAE (PNe)

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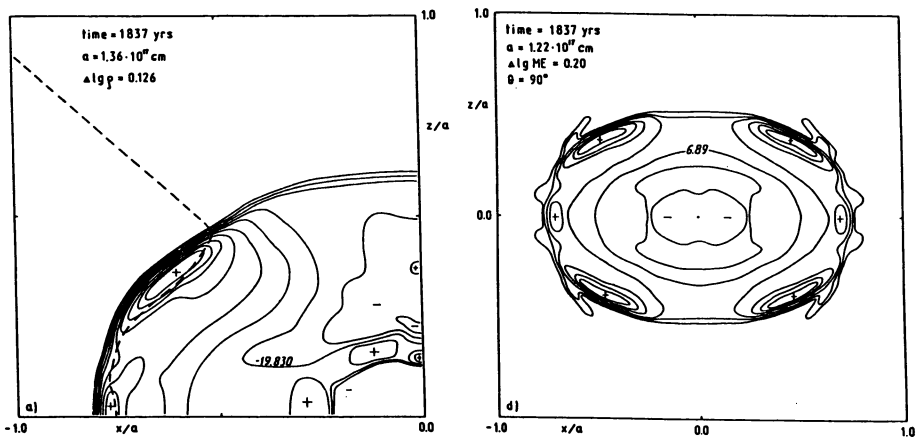
To study the evolution of an expanding PNe formed by non-spherical stellar (super) wind we have computed seven evolutionary sequences for the dusty envelopes with mass 0.05 $M_\odot$ taking angular distribution of mass loss and of the outflow velocity as parameters. In the case described below the gas velocity on the inner boundary is assumed: $V_z=25$ $(1-0.4\ (3\cos^2\theta-1)12)$ km $s^{-1}$ (where $\theta$ is the polar angle) with the density of ejected matter independent on $\theta$. The mass loss rate on the (super) wind phase is $6\ 10^{-5}$ $M_\odot$/yr. The structure of the model at the moment of ionization breaks through PN in the polar direction is illustrated in Fig. 1. The density distribution in a meridional plane is shown in Fig. 1a together with the ionization boundary (the dashed line). Contours of equal emission measure nebula model are shown in Fig. 1b. After complete ionization of PN hydrogen distributions became smoother. We found that some of double-shell PNe may be the product of single mass loss event.

Other six computed models expand significantly the range of possible configurations. The final reason of the great variety of PNe forms can be explained by the geometry of (super) wind forming them. The latter can depend on the duplicity of nuclei.






*S. Torres-Peimbert (ed.), Planetary Nebulae, 459.*