THEORETICAL MODELS FOR THE EVOLUTION OF PLANETARY NEBULAE NUCLEI TESTED BY OBSERVATIONS

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ABSTRACT. We compare theoretical evolutionary tracks of planetary nebulae nuclei with observational data on over a hundred planetary nebulae in the (log L, log T_{eff}, log t_{exp}) space. The simultaneous use of the three coordinates eliminates some interpretation that might be proposed when looking at the (log L, log T_{eff}) plane and at the (M_v, log t_{exp}) only. The inconsistencies which we find between theory and observations could be partly removed by adopting a different distance scale.

Another plot using coordinates which are both independent of distance tends to confirm this view.

The observational data do not specially favour either of the two families of models: hydrogen-burning models or helium-burning ones.

SNAPSHOTS OF EVOLVING MODEL PLANETARY NEBULAE

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ABSTRACT. We have constructed a series of model planetary nebulae along a sequence of evolutionary models for the central star, taking into account the expansion of the nebula. The calculations have been performed using the computer code PHOTO, which calculates the intensities of the emission lines emitted by a nebula in ionization and thermal equilibrium.

The results for the behaviour of the optical emission lines as a function of time are compared to the observations.

Predictions are made for the infrared emission lines, with special attention to planetary nebulae with large overall heavy element abundances, such as are expected to be found in the vicinity of the galactic center.

S. Torres-Peimbert (ed.), Planetary Nebulae, 542.