

Talk at Splinter Meeting

Splinter I

[WN] CENTRAL STARS OF PLANETARY NEBULÆ

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Many low-mass stars, like our sun, evolve through the phase of a central star of a planetary nebula before they end up as a white dwarf. Central stars are post-Asymptotic Giant Branch stars which have shed their outer envelope. The surface temperature of the remaining central star increases and the resulting strong UV flux ionizes the surrounding material, which becomes visible as a planetary nebula.

While most of these stars stay hydrogen-rich on their surface throughout their evolution, a considerable fraction of white dwarfs as well as central stars have a hydrogen-deficient surface composition. Most of these H-deficient central stars exhibit spectra very similar to massive Wolf-Rayet stars of the carbon sequence, i.e. with broad emission lines of carbon, helium, and oxygen. In analogy to the massive Wolf-Rayet stars, they are classified as [WC] stars. Their formation, which is relatively well understood, is thought to be the result of a (very) late thermal pulse of the helium burning shell.

It is therefore surprising that some H-deficient central stars which have been found recently exhibit spectra that resemble those of the massive Wolf-Rayet stars of the nitrogen sequence, i.e. with strong emission lines of nitrogen instead of carbon. This new type of central stars is therefore labelled [WN]. We present spectral analyses of these objects and discuss their evolutionary status and origin.