**Photoionization Modelling of the Wolf-Rayet Central Star of Planetary Nebulae IC 4663 Based On Multiwavelength Observations**

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ABSTRACT

Observations of the central star planetary nebulae (CSPN) IC 4663 reveal that it has spectral features similar to WN sequence of massive Wolf-Rayet (WR) stars and classified as [WN3] spectral type because its spectrum are dominated by broad He II and N V emission lines. The similarity on the composition of O(He) central star and IC 4663 provide evidence for evolutionary sequence [WN] O(He). Evolution of CSPN tried to be modelled by using MESA. Generally, evolution of CSPN IC 4663 followed evolution low-mass star. When it enters white dwarf phase, CSPN of IC 4663 experience once born-again scenario so it goes back to Asymptotic Giant Branch (AGB) phase. But, MESA cannot give the complete evolutionary sequence because of its convergence problem. To investigate both ionization parameters and chemical abundances of the central star, the nebula and its evolutionary status, we constructed the spectral energy distribution (SED) model by using photoionization code CLOUDY based on unique data set from optical to far-IR wavelength (~3 - 160 micron) and include the *Postdam Wolf-Rayet* PoWR stellar models for the stellar flux. Then, we compare the result with the AGB nucleosynthesis to gain insight about the progenitor star of this PN.

*Keywords: Interstellar Matter, Planetary Nebulae, IC 4663, Photoionization Model, Cloudy.*

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